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Training and Information Needs of Cocoa Farmers on Good Agricultural Practices (GAPs) Adoption in Ondo State Nigeria

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Abstract

Cocoa industry is one of Nigeria's most important agricultural sectors, contributing significantly to the economy through export earnings and providing livelihoods for millions of rural farmers. Despite its significance, cocoa productivity in the state has been facing challenges due to low adoption rates of Good Agricultural Practices (GAPs), which include modern farming techniques aimed at increasing yield, improving product quality, and ensuring sustainability. The study therefore assessed the training and information needs of cocoa farmers on GAPs adoption in Ondo state. The study population comprised of both the male and female registered cocoa farmers in the study area. A multistage sampling procedure was employed for the selections of 194 respondents for the study. The data for this study were collected from the respondents using a structured questionnaire while the data obtained were subjected to both descriptive and inferential statistical tools. Descriptive statistical tools employed include frequency counts, percentages, and Weighted Mean Score (WMS) Grand Mean Score (GMS). Pearson's Product Moment Correlation (PPMC) was used to test the hypothesis. In conclusion, it was concluded that the respondents had access to multiple information sources of information enhancing their exposure to agricultural innovations and best practices. Training needs are highest for market-oriented and post-production aspects, while core agronomic practices like soil and planting management are often undervalued despite their foundational importance.

Keywords: Adoption, Training and Information Needs; Cocoa Farmers, Good Agricultural Practices

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INTRODUCTION

Before the discovery of crude oil, agricultural crops such as cocoa were one of the most important sources of revenue and it played prominent roles in the growth, development and stability of the nation's economy (Afolayan and Ajibade 2012). Since after its introduction, West Africa has been the center of production; accounting for two-thirds of the world's cocoa (Afolayan 2017). Cocoa production in Nigeria gained rapid prominence to the extent that Nigeria was the second largest producer in the world by 1965 and continued to maintain the status until the days of increasing oil exploration. During the time cocoa was the major leading cash and export crop in the southern part of Nigeria, with Ondo State being the most prominent (Owoeye and Sekumade 2016; Afolayan 2017). Other states within the country, ranked in order of prominence, include Cross River, Osun, Ekiti, Oyo, Edo, Ogun, Delta, Abia and Akwa-Ibom (National Bureau of Statistics – Nigeria, 2013). Also, cocoa, during this period, ranked the first Nigerian exchange commodity such that the revenue gotten from export was used to finance free education in the south-western region, building monuments such as the Cocoa House Building, Obafemi Awolowo University and Obafemi Awolowo Stadium (formerly known as Liberty Stadium) in Ibadan. Production increased gradually to 308,000 metric tons in 1970/71 (Afolayan 2017).

However, with the emergence of other sources of revenue, particularly crude oil, cocoa production witnessed a decline. This was also blamed by Awe (2013) on military intervention in Nigeria politics in the 80s. By 1999, the production level has declined to 225,000 metric tons (Afolayan 2017). By 2012, Cadoni (2013) has also presented Nigeria among the lowest in cocoa yield alongside Ghana and Cameroon, while Cote d'Ivoire and Indonesia were ranked first and second, respectively. Currently, Nigeria ranks third largest producer cocoa and sixth globally. However, despite the near absolute paradigm shift by government from agriculture to crude oil and discouraging production statistics, cocoa still remains the third source of foreign exchange earning Nigeria.

While a number of variables have been identified as responsible for the declining production metrics, specifically and of direct bearing is poor agricultural practices often adopted in an attempt to get rid of pests and diseases which are the most common constraints to cocoa production. In addition, problems such as low fertility, climate change, global price fluctuation, insufficient processing firms and inadequate access to production inputs such as fertilizers are posing great challenges towards sustainable cocoa production in Nigeria (Afolayan 2017). It is important to realize that loss of nutrients occurs every year, having cumulative effect on soil nutrient status. Indiscriminate cutting down of forest, which seems to be the quest efforts at augmenting production and filling the deficit due to aging of cocoa farms has also been on the increase, with devastating implications for environmental health and sustainability of cocoa production. For example, Morgan-Davies *et al* (2017) and Jumiyati *et al.* (2018) in separate studies concurred that agriculture development that is directed to boost production for self-sufficiency most often results in the occurrence of environmental disasters and over-exploitation of natural resources, which in time would result in the scarcity of essential environmental resources.

In another study, Arsyad *et al.* (2020) also averred that the agricultural practice (such as monoculture) is vulnerable to various environmental constraints and this has negative implications for farmers productivity and income. In contrast, the demand for cocoa, which is largely determined by external factors, has been projected to be on the rise. For example, Beg

et al. (2017) had predicted a 35% rise in the demand for cocoa by 2020. In the face of this increasing demand as projected, the need to command good price in the global market therefore becomes very imperative. Also, Paschall and Seville (2012) assert that about 60% of the world's cocoa is used in chocolate products while the remaining 40% are used for a range of bakery, confectionery and drink products. The continued dependence of Nigeria on other countries for such cocoa products as chocolate and other confectioneries due to non-presence of local industries however, forces cocoa actors in Nigeria to depend on the market force as largely determined by players outside the shore of the country.

The government of Nigeria had in the past made several efforts at improving production, adding value to meet quality standard and ensuring the sustainability of cocoa enterprise. One of such efforts was the establishment of the National Cocoa Development Committee (NCDC). According to Ibiremo *et al.* (2011), the NCDC was setup to provide recommended agrochemicals for farmers at subsidized rate to help combat pest and diseases of cocoa, rehabilitate and regenerate old and unproductive cocoa and sensitize and train farmers on new technologies in cocoa production. Another effort was the establishment of the Cocoa Commodity Board (which has been defunct) to help regulate prices and set good standard for cocoa production. The NCDC was also established with an objective of cocoa rehabilitation and regeneration. The Cocoa Research Institute of Nigeria (CRIN), which has been in operation for decades and have in line with their mandates generated cocoa technologies and improved varieties, while ensuring that such are transferred across to the farmers and other stakeholders. This study assessed the training and information needs of cocoa farmers on GAPs adoption in Ondo state. Specifically, it described the socioeconomic characteristics of the respondents, identified the information sources that cocoa farmers rely on for knowledge on GAPs, assessed the level of adoption of GAPs among cocoa farmers and determined the training and information needs of cocoa farmers on GAPs adoption. It was hypothesized that there is no significant relationship between the selected socio-economic characteristics and training and information needs in the study area

METHODOLOGY

The study was carried out in Ondo State which is located in the southwestern region of Nigeria, lies between latitudes $5^{0}45^{1}$N and 7^{0} 52^{1}N, and longitudes $4^{0}20^{1}$E and $6^{0}05^{1}$E. It is bordered by Ekiti and Kogi States to the North, Edo State to the East, Delta State to the Southeast, Osun and Ogun to the West, and Atlantic Ocean to the South Ondo State covers a land area of approximately 15,500 square kilometers and features diverse physical landscapes, including coastal areas, forests, and rocky terrains. The tropical climate of the State is broadly of two seasons: raining season (April-October) and dry season (November-March). Temperature through the year ranges between 21°C and 33°C with high Relative Humidity. Annual rainfall varies from 2000mm in the Southern areas to 1150mm in the Northern areas. The state enjoys luxuriant vegetation with high forest zones (rain forest) in the south and sub-savanna forest in the northern fringe. Ondo State has a population of around 3.5 million people, with Yoruba being the predominant ethnic group. The economy is largely driven by agriculture, with cocoa, rubber, and palm oil being the main cash crops. Additionally, the state is rich in crude oil and has several oil-producing communities. Multistage sampling technique was used for selecting the respondents which are the cocoa farmers for the study. Ondo state is divided into four (4) agricultural zones and eighteen (18) blocks within the administrative structure of the state by Ondo State Agricultural Development Programme (ODSADEP). The agricultural zones are Akoko zone with 4

blocks, Okitipupa zone with 4 blocks, Owo zone with 4 blocks and Ondo zone with 6 blocks. The first stage involved purposive selection of 50% of the zones, Owo and Ondo agricultural zones based on their dominance in cocoa production in Ondo State. The second stage also involved purposive sampling of 50% of the blocks from each zone, Owo zone (Akure South and Akure North) and Ondo zone (Idanre, Ondo East aand Ile Oluji/Oke-Igbo) based on their dominance in cocoa production. The third stage involved random selection of 4 cells from each of the selected blocks. In the final stage, 50% of the registered cocoa farmers were selected randomly. Thus, a total of 182 cocoa farmers constitute the sample size. Primary data was collected using a well-structured questionnaire. Data were analyzed using descriptive tools such as frequency counts, percentage, mean, Weighted Mean Score (WMS) and Grand Mean Score (GMS). Pearson Product Moment Correlation (PPMC) was used to test the stated hypothesis.

RESULTS AND DISCUSSION

Respondents' socioeconomic characteristics

The result on age presented in Table 1 shows that 35.0% of the cocoa farmers were between 40-49 years of age, 23.7% of the respondents were between 50-59 years of age, 20.5% of the respondents were between 31-39 years of age. Also, 17.4% of the cocoa farmers were above 60 years of age, while 3.1% of the respondents were below 30 years of age. The mean age of the respondents was 48 years. This result implies that cocoa farmers in the study area are dominated by an aging population. This indicates that older farmers often bring experience and knowledge to agricultural practices, which can positively impact production. This finding is consistent with Asamoah and Owusu-Ansah (2017), the majority of cocoa farmers are over 40 years old, reflecting a sector increasingly reliant on aging farmers.

Similarly, Table 1 revealed that 73.2% of the respondents were male while 26.8% of the respondents were female. The results indicate a notable gender disparity, with men overwhelmingly dominating cocoa farming. This trend is consistent with findings Doss (2018), women often have limited access to land, credit, and extension services, which constrains their participation in cash crop production such as cocoa.

The result presented revealed that 80.4% of the respondents were married, 16.5% of the respondents were single, and 3.1% of the respondents were widowed. This result implies that a high percentage of married respondents suggest that cocoa farming likely benefits from family labor. This finding is consistent with Afolami *et al.* (2015) note that married farmers tend to have better support systems and are more likely to engage in long-term agricultural investments, including cocoa farming.

The result shows that 64.4% of the cocoa farmers had tertiary education, 25.3% had secondary education, and 4.6% of the respondents had primary education and adult education respectively. Also, 1.0% of the respondents had no formal education. This indicates a relatively high level of education among cocoa farmers in the study area. A well-educated farming population is often better equipped to adopt improved agricultural technologies, understand extension services, and manage farm enterprises more efficiently. This observation is consistent with findings by Ogunniyi and Oladeebo (2014), who noted that higher levels of education among farmers significantly enhance their capacity to adopt innovations and modern production practices.

The result shows that 66.5% of the cocoa farmers had between 4-6 household size members, 25.2% of the respondents had a household size of more than 7 members while, 8.3% of the

respondents had less than 3 household members. The mean household size was 5 members. This result implies that majority of households had moderate members which could be useful for labor force availability, which is generally favorable for cocoa farming. This is supported by the findings of Oyewo and Fabusoro (2014), who noted that household size significantly affects the volume of labor available for farming in rural Nigeria.

Results presented revealed that 33.5% of the cocoa farmers had between 30-39 hectares farm size for cocoa farming, 29.3% had between 20-29 farm size, and 19.5% had between 40-49 hectares farm size. Also, 11.8% had more than 50 hectares farm size for cocoa farming, 3.1% had between 11-19 hectares while 2.6% of the cocoa farmers had less than 10 hectares farm size for cocoa farming. The mean farm size was 34 ha. This result implies that majority of the respondents operate large scale cocoa farm.

The result shows that 40.7% of the cocoa farmers indicated they personally owned the land for cocoa farming, 25.3% indicated their family owned the land and 17.5% of the respondents indicated their land belong to the community while, 16.4% of the respondents indicated their land tenure system were leased. These findings highlight the diversity of land tenure systems among cocoa farmers in the study area, with individual ownership being the most common arrangement.

Table 1: Distribution of respondents by socioeconomic characteristics (n=194)

Socioeconomic characteristics	Frequency	Percentage	Mean
Age			
≤30	6	3.1	
31-39	40	20.5	
40-49	68	35.0	48 years
50-59	46	23.7	
60≥	34	17.4	
Sex			
Male	142	73.2	
Female	52	26.8	
Marital status			
Single	32	16.5	
Married	156	80.4	
Widowed	6	3.1	
Level of education			
No formal education	2	1.0	
Primary education	9	4.6	
Secondary education	49	25.3	
Tertiary education	125	64.4	
Adult education	9	4.6	
Household size			
≤3	16	8.3	
4-6	129	66.5	5 members
7≥	49	25.2	
Farm size			
≤10	5	2.6	
11-19	6	3.1	
20-29	57	29.3	
30-39	65	33.5	34 ha

40-49	38	19.5
50≥	23	11.8
Land tenure system		
Owned	79	40.7
Leased	32	16.4
Community	34	17.5
Family	49	25.3

Source: Field Survey, 2025

Information sources available to the cocoa farmers on knowledge about GAPs

Result presented in Table 2 shows the distribution of respondents by information sources available to the cocoa farmers on knowledge about GAPs. It could be seen that 91.8% of the respondents indicated government agencies and research institutes as information source, 89.2% indicated access to workshop or training programs, 85.1% of the respondents indicated agricultural extension services. Similarly, 85.1% also indicated fellow farmers, 73.2% indicated farmer's cooperatives or associations, 67.0% indicated mass media, 67.0% indicated digital platforms and mobile apps, 59.8% indicated agricultural input suppliers while 59.3% indicated NGOs and development programs as information sources available to the cocoa farmers on knowledge about GAPs. This implies that all the respondents had access to multiple information sources enhancing their exposure to agricultural innovations and best practices. This finding aligns with Aker (2011) highlights the increasing role of multiple communication channels including digital platforms, farmer associations, and traditional media in disseminating agricultural information, especially in developing countries. The use of diverse sources strengthens knowledge diffusion, reinforces learning, and facilitates the adoption of innovations like GAPs.

Table 2: Distribution of respondents by information sources available to the cocoa farmers on knowledge about GAPs

Information Sources	Frequency	Percentage
Agricultural Extension Services	165	85.1
Farmer Cooperatives or Associations	142	73.2
Fellow Farmers (Peer-to-Peer Learning)	165	85.1
Mass Media	130	67.0
NGOs and Development Programs	115	59.3
Digital Platforms and Mobile Apps	130	67.0
Agricultural Input Suppliers	116	59.8
Workshop or Training Programs	173	89.2
Governments Agencies and Research Institutes	178	91.8

Source: Field Survey, 2025
***Multiple responses**

Level of adoption of GAPs among cocoa farmers

Result presented in Table 3 shows the distribution of respondents by level of adoption of GAPs among cocoa farmers. Application of pesticides or fungicides was ranked 1st with a weighted mean score of 2.88, proper fermentation of cocoa beans was ranked 2nd with WMS of 2.86, use of recommended tools for harvesting was ranked 3rd with WMS of 2.85, storage of records 4th with WMS of 2.81, turning beans in the sun was ranked 5th with WMS of 2.80, monitoring fermentation of cocoa beans was ranked 6th with WMS of 2.76, regular harvesting to avoid overripe pods was ranked 7th with WMS 2.73, pruning to control disease spread was

ranked 8th with WMS of 2.68, separation of ripe and unripe pods during harvest 9th with WMS of 2.65, regular heath check-ups was ranked 10th with WMS of 2.63. The findings implies that cocoa farmers tend to adopt good agricultural practices (GAPs) that provide immediate and visible benefits to yield and income, such as pesticide/fungicide application, proper fermentation, and the use of recommended harvesting tools.

Also, financial record keeping was ranked 11th with WMS of 2.59, proper storage of dried beans and removal of diseased or infected branches were ranked 12th and 13th with WMS of 2.58 respectively, timing of harvesting of ripe pods was ranked 14th with WMS of 2.51, harvesting at the correct height was ranked 15th with WMS of 2.50, planting at the right time was ranked 16th with WMS of 2.48, Sorting and grading beans before storage or sell was ranked 17th with WMS of 2.43, use of personal protective equipment was ranked 18th with WMS of 2.42, labour management keeping and proper spacing of cocoa trees were ranked 19th and 20th with WMS of 2.41 respectively. The results indicate that cocoa farmers generally prioritize GAPs that yield immediate benefits such as pest control, fermentation, and harvesting practices, while placing less emphasis on long-term management, sustainability, and health-related practices.

Furthermore, thinning of excess shade trees was ranked 21st with WMS of 2.40, avoiding damage to the trees during harvest was ranked 22nd with WMS of 2.39, maintaining fermentation duration quality control and assurance, removal of diseased pods were ranked 23rd, 24th and 25th with WMS of 2.38 respectively, maintenance of proper tree height was ranked 26th with WMS of 2.35, safe handling and storage of chemicals, value addition and processing and market information access were ranked 27th, 28th and 29th with WMS of 2.28 respectively, removal of parasite or parasitic weed control such as mistletoe and other organisms was ranked 30th with WMS of 2.26.

The results further reveal variations in the rankings of specific practices. Record keeping for training and workshops was placed 31st with a WMS of 2.25, followed by weed control around cocoa trees (32nd; WMS = 2.24) and the use of integrated pest management (33rd; WMS = 2.20). Planting of shade trees was ranked 34th with a WMS of 2.19, while training on health and safety practices was placed 35th (WMS = 2.18). Regular monitoring of pests and diseases occupied the 36th position with a WMS of 2.14, whereas regular farming of cocoa trees was ranked 37th with a WMS of 2.13.

Market requirements awareness was ranked 38th (WMS = 2.12), and maintaining records of farm activities followed at 39th (WMS = 2.11). Gagging up was placed 40th, while weed control during planting ranked 41st with a WMS of 2.06. The use of traps or barriers was ranked 42nd with a WMS of 2.02. Fertilizer application and awareness of health risks were both ranked 43rd and 44th with equal WMS values of 1.98.

Mulching was ranked 45th (WMS = 1.92), while the use of improved planting materials followed at 46th (WMS = 1.85). Soil testing before planting was placed 47th (WMS = 1.78), organic matter application ranked 48th (WMS = 1.76), and first aid availability was positioned 49th (WMS = 1.74). Cover cropping was ranked 50th (WMS = 1.72). Finally, soil erosion control and export readiness were jointly ranked lowest, at 51st and 52nd respectively, each with a WMS of 1.62.

Based on the Grand Mean (GM), the results indicate that post-harvest practices ranked highest with a WMS of 2.63, followed by harvesting techniques (2.60), record keeping (2.43), and pest and disease management (2.40). Pruning and maintenance occupied the 5th position with a WMS of 2.32, while safety and health practices ranked 6th (2.20). Planting management was placed 7th (2.18), market access and quality standards 8th (2.13), and soil management ranked lowest at 9th with a WMS of 1.80.This result indicates that cocoa farmers place significant emphasis on practices that directly affect the quality and marketability of cocoa. It may be due to higher awareness, training, or the immediate financial benefits derived from proper post-harvest handling. This result implies that there is a clear need for targeted extension services and farmer education programs, especially focusing on low-ranking areas such as soil management, planting techniques, and market access. This is corroborated by Davis *et al.* (2012), who emphasized that agricultural extension services play a crucial role in enhancing smallholder productivity by providing knowledge, skills, and support needed for the adoption of improved practices.

Table 3: Distribution of respondents by level of adoption of GAPs among cocoa farmers

GAPs	WMS	Rank	GMS	GMS Rank
Soil Management			1.80	9th
Soil testing before planting	1.78	47th		
Organic matter application (e.g. compost, manure)	1.76	48th		
Mulching	1.92	45th		
Cover cropping	1.72	50th		
Fertilizer application	1.98	43rd		
Soil erosion control	1.62	51st		
Planting Management			2.18	7th
Proper spacing of cocoa trees	2.41	20th		
Use of improved planting materials	1.85	46th		
Planting at the right time	2.48	16th		
Gapping up	2.08	40th		
Planting shade trees	2.19	34th		
Weed control during planting	2.06	41st		
Pest and Disease Management			2.40	4th
Use of Integrated Pest Management	2.20	33rd		
Regular monitoring of pests and diseases	2.14	36th		
Application of pesticides or fungicides	2.88	1st		
Pruning to control disease spread	2.68	8th		
Use of disease resistant varieties	2.52	13th		
Removal of diseased pods	2.38	24th		
Use of traps or barrier	2.02	42nd		
Pruning and Maintenance			2.32	5th
Regular farming of cocoa trees	2.13	37th		
Maintenance of proper tree height	2.35	26th		
Removal of diseased or infected branches	2.58	12th		
Removal of parasite or parasitic weed control such as mistletoe and other organisms.	2.26	30th		
Thinning of excess shade trees	2.40	21st		
Weed control mount cocoa trees	2.24	32nd		

Harvesting Techniques			2.60	2nd
Timing of harvesting of ripe pods	2.51	14th		
Use of recommended tools for harvesting	2.85	3rd		
Avoiding damage to the trees during harvest	2.39	22nd		
Regular harvesting to avoid overripe pods	2.73	7th		
Harvesting at the correct height (using poles or ladders for higher pods)	2.50	15th		
Separation of ripe and unripe pods during harvest	2.65	9th		
Post-Harvest Practices			2.63	1st
Proper breaking immediately after harvest	2.86	2nd		
Monitoring fermentation of cocoa beans	2.76	6th		
Maintaining fermentation duration	2.38	23rd		
Turning beans in the sun	2.80	5th		
Sorting & grading beans before storage or sell	2.43	17th		
Proper storage of dried beans	2.58	13th		
Safety and Health Practices			2.20	6th
Use of personal protective equipment (PPE)	2.42	18th		
Safe handling & storage of chemicals	2.28	29th		
Regular heath check-ups	2.63	10th		
Training on health & safety practices	2.18	35th		
Awareness of health & of health risks	1.98	44th		
First aid availability	1.74	49th		
Record Keeping			2.43	3rd
Maintaining records of farm activities	2.11	39th		
Financial record keeping	2.59	11th		
Labour management keeping	2.41	19th		
Record keeping for training & workshops	2.25	31st		
Storage of records	2.81	4th		
Market Access and Quality Standard			2.13	8th

Market requirements awareness	2.12	38th
Quality control and assurance	2.38	25th
Value addition and processing	2.28	27th
Market information access	2.28	28th
Export readiness	1.62	52nd

Source: Field Survey, 2025
***Multiple responses**

Training and Information Needs of Cocoa Farmers on GAPs Adoption

The results presented in Table 4 shows the distribution of respondents by training and information needs of cocoa farmers on adoption on GAPs. Use of personal protective equipment was ranked 1st with weighted mean score of 2.98, quality control and assurance was ranked 2nd with WMS of 2.95, market requirement awareness was ranked 3rd with WMS of 2.91, value additional and processing and market information access were ranked 4th and 5th with WMS of 2.90 respectively, use of disease resistant varieties was ranked 6th with WMS of 2.87, use of improved plating material was ranked 7th with WMS 2.86, storage of records was ranked 8th with WMS of 2.80, regular harvesting to overripe pods was ranked 9th with WMS of 2.77 and regular farming of cocoa trees was ranked 10th with WMS of 2.76. This implies that training programs should not only emphasize agronomic practices but also integrate safety, quality assurance, record-keeping, and market-oriented skills**.** This alignment would better equip cocoa farmers to adopt Good Agricultural Practices (GAPs), improve farm productivity, enhance competitiveness, and ensure compliance with evolving market standards.

Also, turning beans in the sun, awareness of health and of health risks and export readiness were ranked 11th, 12th and 13th with a WMS of 2.75 respectively, proper breaking immediately after harvest was ranked 14th with WMS of 2.74, training on health and safety practices was ranked 15th with WMS of 2.69, removal of parasite or parasitic weed control such as mistletoe and other organisms was ranked 16th with WMS of 2.68, proper storage of cocoa beans was ranked 17th with WMS of 2.65, fertilizer application was ranked 18th with WMS of 2.64, gagging up was ranked 19th with WMS of 2.61 and monitoring fermentation of cocoa beans was ranked 20th with WMS of 2.60. Collectively, these findings indicate that farmers' training needs extend beyond farm-level production to include post-harvest processing, quality maintenance, and compliance with health and export requirements**.**

Furthermore, pruning to control disease spread was ranked 21st with WMS of 2.59, application of pesticides or fungicides and sorting and grading beans before storage and sell were ranked 22nd and 23rd with WMS of 2.58 respectively, removal of diseased pods was ranked 24th with WMS of 2.57, planting at the right time was ranked 25th with WMS of 2.56, maintenance of proper tree height was ranked 26th with WMS of 2.55, soil testing before planting was ranked 27th with WMS of 2.53, thinning of excess shade trees was ranked 28th with WMS of 2.52, maintaining fermentation duration and use of integrated pest management were ranked 29th and 30th with WMS of 2.52 respectively. These results implies that while farmers acknowledge the relevance of field management, pest/disease control, and agronomic practices, their training demands are more strongly directed toward safety, market standards, and post-harvest quality practices**.**

Planting shade trees was ranked 31st with WMS of 2.51, organic matter application was ranked 32nd with WMS of 2.46, first aid availability, labour management keeping and record keeping of training and workshops were ranked 33rd, 34th and 35th with WMS of 2.44 respectively, regular health check-ups was ranked 36th with WMS of 2.41, maintaining records of farm activities was ranked 37th with WMS OF 2.37, safe handling and storage of chemical of cocoa beans was ranked 38th with WMS of 2.36, use of traps or barrier and timing of harvesting of ripe pods were ranked 39th and 40th with WMS of 2.35 respectively, regular monitoring of pests and diseases and weed control mount cocoa trees were ranked 41st and 42nd with WMS of 2.34 respectively, removal of diseased or infected branches was ranked 43rd with WMS of 2.33, harvesting at the correct height was ranked 44th with WMS of 2.31, cover cropping, proper spacing of cocoa trees and avoid damage to the trees during harvest were ranked with WMS of 45th, 46th and 47th respectively, weed control during planting was ranked 48th with WMS of 2.26, soil erosion control was ranked 49th with WMS of 2.21, financial record keeping was ranked 50th with WMS of 2.15, mulching was ranked 51st with WMS of 2.08 and use of recommended tools for everything with WMS of 2.07. These findings imply that cocoa farmers prioritize training that directly impacts production quality, market access, and post-harvest handling, while giving less attention to long-term sustainability practices (e.g., soil fertility, erosion control, mulching), occupational health, and financial management. Extension programs must therefore balance farmer-perceived priorities with strategic inclusion of low-ranked but critical practices to ensure both immediate gains in productivity and the long-term sustainability of cocoa farming systems.

Based on the Grand Mean (GM), the results show that market access and quality standards ranked highest (WMS = 2.88), followed by post-harvest activities (2.64), safety and health practices (2.60), and pest and disease management (2.54). Pruning and maintenance was ranked 5th (2.53), while planting management (2.51), record keeping (2.44), and harvesting techniques (2.42) occupied the mid-range. Soil management ranked lowest, with a WMS of 2.36. These findings suggest that farmers' greatest training needs are concentrated in market-oriented and post-production practices, whereas core agronomic areas such as soil and planting management despite being fundamental to sustainable productivity are comparatively undervalued. This is supported by International Cocoa Organization (ICCO, 2020)while foundational GAPs such as soil management and planting techniques are critical for long-term productivity, farmers tend to place more emphasis on post-harvest handling and market requirements due to their direct link with income generation and buyer satisfaction. Similarly, Adegbola *et al.* (2021) found in a study of cocoa farmers in West Africa that farmers demonstrated higher awareness and interest in training related to fermentation, drying, and meeting buyer quality standards, while knowledge of soil fertility management was notably lacking.

Table 4: Distribution of respondents by training and information needs of cocoa farmers on GAPs adoption

Training Activities	WMS	Rank	GMS	Rank
Soil Management				
Soil testing before planting	2.53	27th	2.36	9th
Organic matter application	2.46	32nd		
Mulching	2.08	51st		
Cover cropping	2.28	45th		
Fertilizer application	2.64	18th		
Soil erosion control	2.21	49th		
Planting Management				
Proper spacing of cocoa trees	2.28	46th	2.51	6th
Use of improved plating material	2.86	7th		
Planting at the right time	2.56	25th		
Gapping up	2.61	19th		
Planting shade trees	2.51	31st		
Weed control during planting	2.26	48th		
Pest and Disease Management			2.54	4th
Use of Integrated Pest Management	2.52	30th		
Regular monitoring of pests and diseases	2.34	41st		
Application of pesticides and fungicide	2.58	22nd		
Pruning to control disease spread	2.59	21st		
Use of disease resistant varieties	2.87	6th		
Removal of diseased pods	2.57	24th		
Use of traps or barrier	2.35	39th		
Pruning and Maintenance			2.53	5th
Regular farming of cocoa trees	2.76	10th		
Maintenance of proper tree height	2.55	26th		
Removal of diseased or infected branches	2.33	43rd		
Removal of parasite or parasitic weed control such as mistletoe and other organisms	2.68	16th		
Thinning of excess shade trees	2.52	28th		
Weed control mount cocoa trees	2.34	42nd		
Harvesting Techniques			2.42	8th
Timing of harvesting of ripe pods	2.35	40th		
Use of recommended tools for harvesting	2.07	52nd		
Avoiding damage to the trees during harvest	2.28	47th		
Regular harvesting to avoid overripe pods	2.77	9th		
Harvesting at the correct height	2.31	44th		
Separation of ripe or unripe pods during harvest	2.74	13th		
Post-Harvest Practices			2.64	2nd
Proper breaking immediately after harvest	2.74	14th		
Monitoring fermentation of cocoa beans	2.60	20th		
Maintaining fermentation duration	2.52	29th		

Turning beans in the sun	2.75	11th		
Sorting and grading beans before storage and sell	2.58	23rd		
Proper storage of cocoa beans	2.65	17th		
Safety and Health Practices			2.60	3rd
Use of Personal Protective Equipment (PPE)	2.98	1st		
Safe handling and storage of chemical	2.36	38th		
Regular health check-ups	2.41	36th		
Training on health and safety practices	2.69	15th		
Awareness of health and of health risks	2.75	12th		
First aid availability	2.44	33rd		
Record-Keeping			2.44	7th
Maintaining records of farm activities	2.37	37th		
Financial record keeping	2.15	50th		
Labour management keeping	2.44	34th		
Record keeping of training and workshops	2.44	35th		
Storage of records	2.80	8th		
Market Access and Quality Standard			2.88	1st
Market requirement awareness	2.91	3rd		
Quality control and assurance	2.95	2nd		
Value additional and processing	2.90	4th		
Market information access	2.90	5th		
Export readiness	2.75	12th		

Source: Field Survey, 2025
***Multiple responses**

Pearson Product Moment Correlation Analysis showing the relationship between the selected socioeconomic characteristics and training and information needs

PPMC analysis in Table 5 showed that there is significant relationship between age (r=0.502** p=0.000), marital status (r=0.424** p=0.000), household size (r=-0.152* p=0.034), annual income (r=0.453** p=0.000), and training and information needs. This result implies that as individuals grow older, their need for training and updated information increases. This may be due to their desire to remain relevant, adapt to changing agricultural technologies or methods, and bridge knowledge gaps that widen with technological advancement. This is supported by Adebayo and Adesope (2015), who found that older agricultural professionals demonstrated a stronger interest in continuous training and capacity development in order to maintain their relevance and effectiveness in an evolving agricultural landscape.

Married individuals are more likely to express a need for training and information. This could be because of their role as family heads or income providers, leading to increased motivation to improve productivity through better knowledge and skills. This finding aligns with Ajaero and Anorue (2018)**,** who reported that marital status had a significant influence on farmers' information-seeking behaviour, with married respondents showing higher interest in accessing agricultural training and extension services to support their families.

Table 5: Pearson Product Moment Correlation Analysis showing the relationship between the selected socioeconomics characteristics and training and information needs

Variables	r-value	P-value	Remark
Age	0.502**	0.000	Significant
Sex	0.155*	0.031	Significant
Marital status	0.424**	0.000	Significant
Educational status	0.154*	0.033	Significant
Household size	-0.152*	0.034	Significant
Farm size	0.126	0.080	Not significant
Years of experience	-0.112	0.129	Not significant
Source of credit	-0.048	0.506	Not significant
Annual income	0.453**	0.000	Significant

Correlation is significant at 1%

Correlation is significant at 5%

Correlation is significant at 0.05 level (2-tailed)

Source: Computed data, 2025

CONCLUSION AND RECOMMENDATIONS

The study concluded that the respondents had access to multiple information sources of information enhancing their exposure to agricultural innovations and best practices. Training needs are highest for market-oriented and post-production aspects, while core agronomic practices like soil and planting management are often undervalued despite their foundational importance.

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