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Original Article

Comparative Assessment of Extension Delivery in the Volta Cocoa Region of Ghana

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Abstract - *Effective extension delivery is critical for increasing cocoa farmer' competencies to improve their innovation adoption levels. This study comparatively assessed extension delivery in the Volta Cocoa Region of Ghana following a mixed-method approach. A total of 420 sampled cocoa farmers from the Hohoe, Jasikan, and Papase Cocoa Health and Extension Division (CHED) districts were surveyed, whereas participants for in-depth interviews and Focus Group Discussions were purposively selected. The results indicate the prevalence of pluralistic extension delivery in the region. CHED, complemented mainly by Cocoa Abrabopa Association and Solidaridad-MASO private actors, was found to be responsible for extension delivery in the region. These organisations have similar and differentiated objectives, structure and key staff; coverage and target farmers; shared innovations and support services; and extension methods and materials used. Radio, calendar, poster, books, etc., were deemed effective, while demonstrations, field days, phone calls, drama, and farmer rallies were found to be somewhat frequently used in the delivery of extension. The number and coverage of participating private extension providers were found to be low. It is recommended that CHED partner with existing and other private extension actors to widen the scope and benefits from their programmes to a majority of cocoa farmers in the region.*

Keywords - *Cocoa Farmers, Innovation Dissemination, Pluralistic Extension, Comparative, Volta Cocoa Region.*

1. Introduction

The cocoa farmer, as part of the cocoa innovation system of Ghana, is important for the existence of other stakeholders in the cocoa industry as well as extension efforts [11]. Ghana's efforts towards raising its cocoa production levels and strengthening quality standards require enormous support for cocoa farmers across the seven cocoa-producing regions of Ghana. The Volta Cocoa Region has been an integral part of the cocoa production and development history of Ghana, contributing 20,729 metric tons (9.6 %) of total COCOBOD purchases at the onset of the Ghana COCOBOD purchases records in the 1947/48 season. Through the 1959/60 season, the region continued to contribute an average of 10 percent of national cocoa purchases [39]. However, in recent years, the region has contributed less than one percent to total national cocoa production volumes. To raise cocoa production levels, efforts are being made to increase production in all producing regions of Ghana. [8] indicates that policies involving technology transfer and training in good cocoa farming practices are required to improve cocoa farmers' managerial skills to increase cocoa outputs in the Volta Cocoa Region [30]. Moreover, increasing cocoa productivity necessitates the need for the government to make cocoa extension more effective to result in increased farmer competencies to adopt shared innovations [1,5].

Agricultural extension according to [7] is a *"System That Should Facilitate The Access Of Farmers, their organisations and other market actors to knowledge, information, and technologies; facilitate their interaction with partners in research, education, agribusiness, and other relevant institutions; and assist them to develop their own technical, organizational and managerial skills and practices"* Cocoa extension delivery in this study refers to the dissemination of cocoa farming innovations and facilitation of inputs and related services by the public and private extension providers to cocoa farmers to raise their competencies, adoption, yield, and income levels.

The approach employed in the delivery of extension is critical for the success of the extension programme. The extension approach thus aids extension practitioners to understand the fundamentals, functional methods, and concepts of extension used by extension organisations to achieve their goals, particularly during the planning stage [10]. The commodity specialized extension approach focuses extension delivery on increasing the quality and quantity of export crops such as cocoa, coffee, and cashew, amongst others [6]. CHED and private actors (private

businesses, NGO's, CSOs, FBOs, etc.) use this approach to deliver extension services to cocoa farmers in Ghana.

Extension methods and materials have been widely used by extension providers in the extension delivery process to clarify ideas and transfer innovations to a large and diverse audience of farmers, as well as to achieve the goal of the extension delivery [4,21]. The choice of an extension method is determined by technological applicability, adaptability, and acceptability into the system, as well as the economic feasibility, environmental safety, social and cultural acceptability, suitability for the long term, audience configuration, and content relevance [12]. Individual extension methods such as home and farm visits, office and phone calls, informal contacts, personal letters, adoptive or mini-kit trials, and farm clinics [20] are most effective when carried out by or under the sole authority of a single farmer or household, allowing the farmer to receive the extension agent's full attention [20]. Group extension methods, such as demonstrations, farmer Field Schools (FFS), farmer days, and tours, allow the agent to meet with a group of farmers and are appropriate for discussing issues that affect the entire group or community [20,35]. Moreover, mass media have been considered as an important tool for delivering extension to a vast audience within a short period of time.[13]. Media, including radio, film, music, video, television, media exhibitions, campaigns, and agricultural festivals, enable long-distance transfer of information, whereas digital media necessitate computer and mobile phone access for extension delivery [13,20]. Social media such as YouTube, Facebook, and Twitter (now *'X'*) are also useful mass media tools for effective extension delivery [20]. Because more than one sense is used in the learning and teaching process, the use of a variety of extension methods and aids, moreover, ensures that every member of the farmers' audience is affected by the ideas and new agricultural technologies communicated to them [4].

The cocoa extension system of Ghana is decentralised, led by CHED through its national, regional, district, and operational area systems, and pluralistic [25] involving private actors complementing efforts of CHED. The pluralism of extension providers results in coordinated partnerships to improve delivery [26] as well as increases farm size, farmer outputs, and income [23]. Cocoa farmers in the Volta Cocoa Region exist within a context of pluralistic extension [18], receiving similar and differentiated shared innovations and extension supports from CHED and private organisations, particularly the Cocoa Abrabopa Association (CAA), the Solidaridad-West Africa MASO programme, and other actors, including input marketers. Whilst there is an extant literature on cocoa extension delivery in the other six cocoa regions of Ghana (Western North, Western South, Eastern, Ashanti, Brong-Ahafo, and Central) [36-37], knowledge on the role of cocoa extension providers, structure, and activities, particularly for the Volta cocoa region, is, however, limited in the literature. The low, fluctuating, and dwindling cocoa production contribution of the Volta Cocoa Region, despite the prevalence of pluralistic extension supports, requires investigating the nature of extension delivery in the region. This study, therefore, comparatively assessed extension delivery by the public cocoa extension provider, ChED, and various private providers in the Volta Cocoa Region of Ghana. Findings from this research are relevant for policymakers and stakeholders in cocoa extension delivery to design and effectively implement extension programmes, as well as to provide relevant cocoa farming supports to increase the cocoa production levels in the Volta Cocoa Region of Ghana.

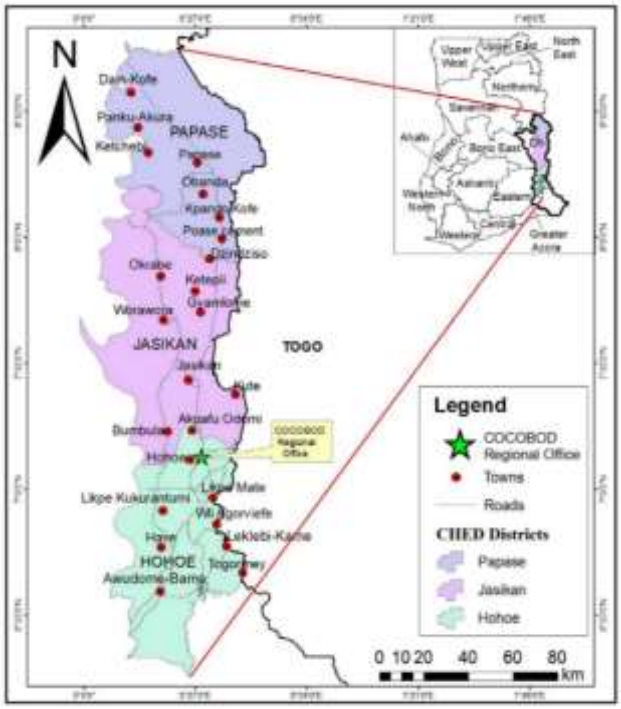

Fig.1 Map of study area indicating CHED Districts and sampled communities

2. Materials and Methods

The study was undertaken in the three CHED districts (Hohoe, Jasikan, and Papase) of the Volta Cocoa Region of Ghana. The Volta cocoa region covers the middle to northern parts of Volta and almost the entire Oti political region of Ghana. The region shares a boundary with the Republic of Togo to the east, with the Eastern and Bono East Region to the West, and to the north with the non-cocoa-producing parts of the Oti-political Region. Cocoa production in the Volta Cocoa Region covers 8,244.25 ha and is farmed by about 13,528 cocoa farmers [32]. The cocoa production level in the Volta cocoa region has been generally sustained by extension delivery by CHED and private actors.

This research employed the convergent parallel mixed method design [38]. This approach led to collecting both quantitative and qualitative data over the same period in the study area. The population of the study includes cocoa farmers who have at least five years of [32]. Dealing with this population led to the collection of data on cocoa farmers' perceptions and experiences of extension delivery.

A multi-stage sampling technique was employed in this study. The three CHED districts: Hohoe, Jasikan, and Papase were purposively selected. The sample size was determined following [34] and [24] for a 10 % non-response rate, which resulted in selecting 420 cocoa farmers (140 participants each from the three CHED districts) through a simple random sampling technique. A purposive sampling technique was used to select participants for the qualitative aspects of the study. Key informants such as lead farmers, opinion leaders, and extension staff were involved in the in-depth interviews, whilst both male and female, youth cocoa farmers and lead farmers participated in the Focus Group Discussions (FGDs). Observed cocoa farms, communities' cocoa sheds, and extension delivery materials were purposively and accidentally selected. Data was collected using interview schedules for the survey, and interview guides were used for the In-depth interviews and FGDs. In all, twenty-three randomly selected cocoa farming communities (*Shown in Figure 1)* across the Volta Cocoa Region were involved in the study. A total of 74 and 13 participants were respectively involved in the six FGD (12 participants on average) and in-depth interviews. The cocoa extension delivery practices in the Volta Cocoa Region were comparatively assessed based on thematic areas such as extension service providers and extension objective, structure, and key staff; coverage and targeted farmers; shared innovation and support services, as well as the extension methods and materials used in the extension delivery. The frequency of use of extension methods was assessed on a five-point Likert scale (1-5) from Very Lowly Frequent (VLF), Lowly Frequent (LF), Somewhat Frequent (SF), Frequent(F) and Very Frequent (VF); whilst Cocoa farmers perceptions of the effectiveness of the extension materials contribution to their understanding of shared cocoa innovations was similarly estimated on a five point Likert scale (1-5) of Very Lowly Effective (VLE), Lowly Effective (LE), Moderately Effective (ME), Effective (E) and Very Effective (VE). The means and standard deviations of the scales were estimated. The quantitative data were analysed using the SPSS statistical tool, whilst the qualitative data from in-depth interviews and FGDs were transcribed and labelled with pseudo names to reflect the confidentiality of respondents. Codes were created reflecting various themes on extension delivery, and comparative analysis was conducted. The qualitative data were analysed using the NVivo 12 software. Both quantitative and qualitative results were triangulated to respond to the research objective.

3. Results and Discussions

3.1. Socio-Demographic Characteristics of Cocoa Farmers in the Volta Cocoa Region

The results in Table 1 indicate cocoa farmers in the Volta Cocoa Region are dominated by Ewes (64%), Guans (15%), and Akans (7.4%) ethnic groups. Others (8.3%) who are mostly of Busanga and Togolese origins were also found to be farming cocoa in the Volta Cocoa Region of Ghana. This suggests the need for extension delivery to employ multiple and appropriate languages to meet the understanding of these farmers. The mean age of cocoa farmers in the Volta cocoa region is 49 years (SD = 13 years). Though lower than the 51 years found by [11], almost two out of every ten cocoa farmers were found to be over 60 years old. The mean years of cocoa farming by farmers in the Volta Cocoa Region is 15 years (Range of 2-51 years). It was revealed from the FGDs that cocoa farmers begin cultivation of other crops for consumption prior to engaging in cocoa farming.

The results further indicate that cocoa farmers owned their cocoa farms through farming on own farmlands, outright purchase of farms from other farmers, sharecropping, and/or by inheritance. The results show that cocoa farmers have worked as cocoa farmers for 2 to 51 years. It is important that more youth are supported in the region to engage in cocoa farming as they are thought to be more innovative, and more likely to adopt cocoa farming technologies to improve the cocoa farming position of the region [31].

The results further show that 86.9 % and 13.1 % of the cocoa farmers were males and females. Men have been found to adopt Good Agricultural Practices (GAPs) better than women, a phenomenon that could also be attributed to their higher education levels [33]. Extension providers in the region also need to focus and deepen support for more women through the timing of training and access to other supports, such as inputs to enable them to meaningfully engage in cocoa farming in the Volta Cocoa Region.

Moreover, the majority (89.5 %) of cocoa farmers received formal education, whilst 10.5 % had no formal education. Every three (3) out of 5 the surveyed cocoa farmers had completed JHS/ MSLC, while 17.9 % and 7.1 % respectively completed SHS and Tertiary levels of education. Other types of education (3.3 %) received by cocoa farmers include Arabic and French education. This result implies the majority of cocoa farmers in the Volta Cocoa Region are literate and hence are able to read and understand the various shared cocoa farming innovations and training materials provided to them.

Less than a fifth (17.1 %) of the cocoa farmers held cocoa farming leadership positions as chairpersons, secretaries, assistant secretaries, treasurers, and organizers. Other leadership positions held by these farmers included being Purchasing Clerks (PCs)/Collectors (6.9 %), Chief farmers (9.7 %), MASO Mentor/facilitator (4.2 %), opinion leaders (primarily chiefs) (4.2 %), and CODAPEC Mass Sprayers (5.6 %). Having a leadership position influences innovation adoption because lead farmers are more likely than others to adhere to shared cocoa innovations [33].

A total of 95 % of cocoa farmers in the region owned up to four mobile phones. Mobile phones aided extension providers to schedule meetings and training, respond to shared problems, and receive feedback. Farmers also use mobile phones to conduct mobile money financial transactions.

Table 1. Socio-Economic Characteristics of Cocoa farmers

Characteristics	Description (N=420)
Age (years)	Mean: 49, SD: 13, Range: 20-87
Sex (Dummy)	Male: 86.9% Female:13.1%
Ethnicity (Number)	Ewe: 64%, Guans: 15% Akans: 7.4%, Basaare: 7.4% Ga/Adamgbe: 1.0%, Others: 8.3%
Formal Educational (Years)	Formal: 89.5% Non-formal: 10.1%
Years of cocoa farming (Years)	Mean: 15 SD: 9 Range= 2 – 51
Cocoa Leadership position held (Dummy)	Yes: 17.1% No: 82.9%
Extension system	Only CHED (80.2%; Both CHED and private (19.8%)
Belonging to an Association/Group	Yes: 78% No: 22%
Mobile Phone Ownership	Yes: 95% No: 5%
Extension Contacts	Face to face and Electronic: Mean: 13 and SD: 34

The majority (69.8%) of cocoa farmers owned non-Smart (Feature) phones, variously referred to locally as *'Keypad,'* '*Gematsoe'* (*if it falls, will pick it'* in the Ewe language, indicating durability of the phone), and '*Yam'* by the cocoa farmers. Smartphones (also known as *'Touch'*) were owned by 28.6% of the cocoa farmers in the region. Smartphone ownership aided cocoa farmers in retrieving cocoa-related information, particularly from Cocoalink applications and from other social media platforms. Almost four out of every five cocoa farmers (78 %) were found to belong to a farmer group organized by CAA, Solidaridad-MASO, and COCOBOD CHED. The study found that COCOBOD-CHED led the organization of cocoa farmers into groups of thirty members. Organized farmer groups are expected to register with the district and national cooperative systems (i.e., Department of Cooperatives) [10]. Membership in an FBO and cooperatives is critical as this assists farmers to promptly receive technical and farm input supports, which are typically expensive to obtain as an individual, as buttressed by [10]. Moreover, farmers' participation in group activities facilitates social capital through the exchange of knowledge and dealing with common problems confronting them as farmers [33,16]. Cocoa farmers in the Volta Cocoa Region were found to receive an average of thirteen (SD: 34) extension contacts annually—this covered face-to-face (Mean:7 and SD:28) and electronic (Mean:5 and SD:14) contacts. Cocoa farmers received extension contacts from CHED (Mean:11 and SD:32) and private extension providers (Mean: 2 and SD:7). The study found group leaders, chief farmers, and other lead farmers had increased contacts from extension officers, which accounts for the wide standard deviation observed. Extension agents usually send messages regarding meeting scheduling, feedback to lead farmers for their use, and/or to communicate the information to other cocoa farmers in their groups or communities.

3.2. Comparative Assessment of Extension Delivery in the Volta Cocoa Region

A total of four out of every five (80.2 %) cocoa farmers received extension solely from CHED, whilst nearly one-fifth (19.8%) engaged in pluralistic extension (Mainly CAA and Solidaridad extension schemes in addition to CHED). Most of the pluralistic extension receivers (91.5%) were found to be registered with one private extension provider, whilst 8.5% were registered with both CAA and Solidaridad-MASO extension schemes. The result of the comparative assessment of extension delivery in the Volta Cocoa Region is presented in Table 2.

3.2.1. Extension Objective

CHED is the public entity under COCOBOD mandated to support cocoa extension delivery in the Volta Cocoa Region with an objective to increase farmers' competencies in cocoa farming and to address their cocoa disease problems. The CAA extension is based on a sustainability (Certification) scheme and hence organizes cocoa farmers to produce certified cocoa for international clients for premiums.

Solidaridad-MASO, which literally means 'Picking Up Something Or Coming Of Age' in the Akan language, aims to reduce youth unemployment in cocoa-growing areas by providing holistic training to young persons (17-25 years old) and to introduce them into cocoa farming on a full or part-time basis. These objectives aim at generally addressing the cocoa farming competencies of farmers, support and marketing skills of farmers, which are essential for introducing and keeping them in the cocoa farming business.

3.2.2. Structure Of Extension Delivery And Key Extension Staff

In the CHED extension delivery structure, District Extension Coordinators direct extension activities in the districts (Hohoe, Jasikan, and Papase) and report to the Regional Extension Officer, who reports to the National Technical Extension Manager through the Regional COBOBOD Manager. Community Extension Agents (CEAs) in charge of operational areas in the CHED districts are supervised by District Extension Coordinators. The CEAs are mainly in charge of training and assisting with the distribution of COCOBOD inputs, facilitation, and providing other related supports that concern the farmers within their operational areas.

Table 2. Comparative Assessment of Extension Delivery in the Volta Cocoa Region

Extension provider	Extension objective	Structure and Key Staff	Coverage and Target farmers	Innovations shared and support Services	Extension Methods and Materials used
Cocoa Health and Extension Division (CHED) (Public)	The main public entity responsible for cocoa commodity specialized extension and control of cocoa diseases.	Technical Extension Manager, Regional Extension Officer, District Coordinators, Community Extension Agents.	Responsible for all cocoa farmers in the region. Operates throughout the three CHED districts	Train farmers on GAPS, Cocoa purchases, and Farm Business management. Support cocoa farmers with farm mapping services, subsidized and free cocoa inputs, spraying gang, hand pollination, pruning services, and alternative livelihood activities.	**Methods** • Result and method demonstrations • Farm and home visits, • Meetings, • Rallies and durbar, • Farmers days, • Office calls, • Farmer Business School, • Farmer Field days, etc. **Materials:** Books, Posters, Radio, Cocoalink app, etc.
Cocoa Abrabopa Association (CAA) (Private-FBO)	Train farmers to produce cocoa under certification standards (Rainforest Alliance labels)	Council, Executive Secretary, Operations/ Extension manager, Regional Managers, Technical Coordinators	Targets farmers for the cocoa sustainability programme across the three CHED Districts	Training on GAPs and Certification standards, provision of input credits, purchasing cocoa with a free scale using a collector system.	**Methods** • Result and method demonstrations • Farm and home visits, • Meetings, • Annual General Meetings **Materials**: Cropping and certification standard calendars, record books, passbooks, posters, etc.
Solidaridad-MASO (Private-NGO)	Introduce youth into cocoa farming	Regional managers, facilitators, mentors	Operates in selected operational areas. Introduces youth aged 18-25 years into Cocoa farming	Cocoa agronomy, financial, Social, and legal literacy	**Method:** • Training under a Classroom setting • Mentorship and coaching, • Result and Method demonstrations, • Farm and Home visits, • Farmer Field days, etc. **Materials:** Training guide, flip charts, etc.

CHED has physical offices at Hohoe (within the main Regional COCOBOD office), Jasikan, and Papase districts to administratively support extension activities in the Volta Cocoa Region.

Under the CAA system, the executive secretary oversees the general management of the association and reports to the council (comprising Farmer Regional Representatives and a council chairperson).

The extension/Operations manager supervises the Regional Manager, who oversees activities in the Volta Cocoa Region. Technical Coordinators (TCs) in the region report directly to the Regional Manager and directly supervise and coordinate activities of registered farmer groups and farmers. The Solidaridad-MASO delivery system comprises regional managers responsible for supervision and training; facilitators who train farmers in classroom and field settings. Engaged mentors (experienced and achieved farmers) were responsible for coaching and mentoring youth cocoa farmers and reporting on their progress to MASO facilitators and Supervisors.

3.2.3 Coverage and Target Farmers

The CHED extension is targeted at all cocoa farmers in the Volta Cocoa Region, as mandated by the Ghana COCOBOD. The CAA operates in the three CHED districts but targets only farmers and groups who voluntarily register to participate in the Certification programme after being sensitized on the scheme. Cocoa farmers in groups usually register (at a fee) to be included in the CAA programme. Registered farmers are provided with Traceable Unique Identity Numbers (e.g., CAAVR06002M02) on cards which indicate the name of the Organisations Name (CAA), Region (VR), Year Of Registration (06 for 2006), Group Number (002), Gender of Farmer (M for male), and Position of Farmer (Number) in the group (e.g., 02 indicating the second registered person in the group). The Solidaridad-MASO programme has, since the inception of the project, trained 11,000

youth, 40% of whom are females, in the Likpe, Liate, Kpoeta, Kadjebi, Lolobi, Akpafu, and Jasikan areas.

3.2.4. Innovations and Support Services

The predominant extension delivery provided by CHED focuses on the implementation of Good Agronomic Practices (GAPs), Rehabilitation of Diseased and Moribund Farms, Control of CSSVD, and Implementation of Productivity Enhancement Programmes (PEP) (Including Mass Pruning And Spraying, Hand Pollination, etc.). Farmers are also trained on the diversification of their livelihood activities to improve their overall household income. The PEP engaged pruning and spraying gangs are provided with equipment and Personal Protective Equipment (PPE) to prune and spray cocoa farms that have been mapped under the CHED system. Spraying Gangs' personnel also work collaboratively with CEAs and Chief farmers to inform farmers on when farming activities should be performed.

Generally, CAA's operational year activities are categorized into sensitization and registration, input distribution, farm mapping, internal and external audits, cocoa purchases, and input repayment (Recoveries). Farmers are also given fertilizers (Asaasewura), insecticides (Confidor), fungicides (Nordox and Ridomil), a Matabi Knapsack sprayer, and a group motorized sprayer [3]. TCs ensure farmers adhere to the shared Rainforest certification standards (merger of UTZ and Rainforest standards) related to environmental, economic, and social issues, including 'free scale' (no scale adjustment by collectors). Farmers under the scheme are also prepared through internal audits for an external audit, which must be passed to enable them to sell their cocoa beans as certified for a premium. Under the Solidaridad-MASO system, participating youth are trained for six months in groups on Good Agricultural Practices, diversification, and other relevant topics by a trained facilitator at the community/society level.

3.2.5. Extension Methods and Materials Used

CHED extension is extended to cocoa farmers through a general and a cooperative system that employs farm and home visits, meetings, demonstrations, radio campaigns, office calls, rallies/durbars, and other methods of extension delivery. Through the GIZ introduced [14] Farmer Business School, CHED trains farmers in farm business Management, including record keeping, diversification (into other crops such as vegetables, cereals (maize and rice), yams, cassava, and livestock), to enable them to keep their farms as a business. Farmers were provided certificates after completion of the GIZ Farmer Business School. CHED also trains Farmers on agro-processing activities (gari, dough, oil, and so on) and trading. CHED uses books, posters, radio, and the Cocoalink application as main extension materials. CAA employs methods such as farm and home visits, demonstrations, group meetings, and Annual General Meetings (AGMs) (held to present audited financial statements, hold elections, and recognize outstanding farmers at the group, regional, and national levels) in its extension delivery processes. Farmers are also given cropping and certification standard calendars (which illustrate steps to increase yield, types, and quantities of cocoa inputs to apply and PPEs, such as hats, overalls, respirators, goggles, gloves, and boots to use), record books, and posters, among other things, as primary extension materials.

The certification calendar displays images and labels of the internal standards that farmers are expected to strictly follow. CAA also has a slogan in the Twi language as '*Adwumaden ne Nokwaredi, eye paa!!*' (meaning '*hard work and truthfulness are very good'*). This slogan is usually recited at meetings and other gatherings to emphasize the need for participating cocoa farmers to produce quality cocoa beans following the shared improved methods and using the provided and recommended approved inputs. The extension delivery method used by MASO includes recruiting youth and training them for six months using training facilitators and/or program officers. Lectures, demonstrations, home, and farm visits are used. Flipcharts and handouts are the main training methods and materials used by facilitators. Solidaridad uses hands-on, practical, and audio-visual aids, especially for individuals who cannot read or write. Trained youth put what they have learned in the classroom setting into practice by establishing a model farm and implementing cocoa management practices (e.g., pruning, fertilizer application, spraying, etc.). Solidaridad provided machetes and personal protective equipment, fertilizer, fungicides, insecticides, mistblowers, knapsack sprayers, and pruners kept at the district office are made available to youth groups upon request to use in undertaking activities at the respective demonstration farms.

3.3. Frequency and Effectiveness of Extension Methods Used.

The results (Table 3) generally indicate that cocoa farmers in the Volta Cocoa Region perceived that extension methods were used on a somewhat frequent basis. The finding indicates cocoa farmers in the region appreciate farm visits, home visits, and demonstrations. Individual extension methods are also critical for cocoa extension delivery. For instance, using farm and home visits increases participation in extension activities [2]. Cocoa farmers, through FGD, indicate that CEAs' inability to visit their farms regularly resulted in some farmers not using shared agrochemicals, cocoa, and shade tree seedlings provided to them by COCOBOD or by private extension providers. Farm visits are essential for clarifying farmers' ideas and should therefore be enforced [17] by extension providers in the region to deal with individual challenges faced by respective cocoa farmers.

The FGD revealed that cocoa farmers in the Volta Cocoa Region prefer demonstrations done on their farms over the electronic method using phones by extension agents. Radio, calendar, poster, books, television (particularly Akuafo TV programs), and training guides were deemed effective by cocoa farmers. Cocoa farmers

cited the importance of radio programmes broadcast on Beyond FM-90.7 MHz at Nkwanta in the Papase Cocoa district, Lorlornyo FM-93.3 MHz in the Hohoe Cocoa District (Hohoe), and erstwhile Sekpelle FM-104.3 MHz at Jasikan Cocoa district (Likpe-Mate) to support and improve their competencies in cocoa farming. The convenient timing, farmers' ability to contribute to the programs, and receiving feedback almost immediately were indicated as relevant to the radio programmes. Cocoa farmers generally complained about the non-publication of the COCOBOD *Cocoa Newspaper* in recent years and look forward to reading new versions of the paper in order to stay up to date on cocoa development issues in Ghana and globally. Beneficiaries rate flipcharts, commonly used by Solidaridad-MASO facilitators, as effective. The flip charts, which display notes and illustrations on GAPs in cocoa farming and farm business, are hung on a stand in a classroom setting and flipped to highlight the training by the facilitators. The study found that various books titled: '*Group Record,' 'Field Training Workbook*,' '*Farmer Business School,'* as well as *'Doing Good Business with Cocoa,'* provided to cocoa farmers in the region were perceived as effective. The books were, however, mostly written in the English language. There is a need for CHED and private extension actors in the region to provide audio and video versions of these books to support the relevance of the contents to cocoa farmers in the Volta Cocoa Region. Farmers who were not very literate in the English language and hence unable to read by themselves, however, disclosed in the interviews and FGDs that their literate dependents and group leaders were responsible for providing explanations on the content of the books to them.

Table 3. Effectiveness of ETMs and Frequency of Use of Extension Methods

Effectiveness of ETMS				Frequency of Use of Extension Methods			
ETMS	**n**	**Mean**	**SD**	**Extension Method**	**n**	**Mean**	**SD**
Books	237	3.9	1.1	Home Visit	265	2.7	1.3
Training Guide	64	3.5	1.2	Farm Visit	300	2.9	1.3
Folder	30	3.4	1.2	Method demonstration	405	3.3	1.0
Newsletter	33	2.9	1.4	Result demonstration	407	3.3	0.9
Training Manual	30	3.0	1.4	Field days	99	3.2	1.2
Cocoa Newspaper	20	3.1	1.4	Fieldtrip	58	2.7	1.3
Handouts	22	3.2	1.4	Lectures	74	3.0	1.3
Poster	158	4.1	0.9	Office calls	134	3.1	1.5
Calendar	92	4.2	1.2	Phone Calls	173	3.3	3.2
Flipcharts	56	3.5	1.2	Meetings	376	3.2	1.1
Power points	29	3.0	1.5	Drama	67	3.0	1.2
Radio	398	4.2	1.1	Farmer rallies	163	3.3	1.2
Television	47	3.5	1.4				
Video	24	3.0	1.7				

4. Conclusion and Recommendations

COCOBOD CHED has a decentralized (Regional, district, operational area, and communities) presence in the Volta Cocoa Region of Ghana. COCOBOD-CHED and related departments showed responsibility in carrying out their mandate as the COCOBOD (Public) cocoa extension delivery division in the Volta Cocoa Region of Ghana. The Cocoa Abrabopa Association and Solidaridad, through the MASO programme, were found to be the main private organisations providing cocoa extension in the Volta Cocoa Region, with a lower number of farmer participation (19.8 percent under pluralistic extension). Demonstrations and phone call extension methods, as well as radio, posters, calendars, books, and television training materials, have all been shown to improve cocoa farmers' understanding and competencies in cocoa farming in the Volta Cocoa Region. CAA and Solidaridad-MASO operating in the Volta Cocoa Region are required to widen the scope of their programmes to include more cocoa farmers than currently covered. It is also recommended that COCOBOD-CHED at the national and regional levels, through partnerships, must encourage other private cocoa extension organizations to expand their programmes to include cocoa farmers in the Volta Cocoa Region.

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