

Cocoa Livelihoods Program: Phase I Evaluation/Phase II Baseline

Final Report Prepared By:
Management Systems International

April 15, 2014

This publication was produced for the World Cocoa Foundation. It was prepared by Management Systems International.



Cocoa Livelihood Program: Phase I Evaluation/Phase II Baseline:

Final Report



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WCF # MSI-01-2013

MSI # 607900.01

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Acronyms

ADP	Agricultural Development Program (Nigeria)
ANADER	National Agency for Rural Development (Cote d'Ivoire)
ASI	Agribusiness Systems International (ACDI/VOCA)
BSC	Business service center
CEA	Cocoa extension agent
CLP	Cocoa Livelihood Program
COCOBOD	Cocoa Board (Ghana)
CRIN	Cocoa Research Institute of Nigeria
CNRA	National Center for Agricultural Research (Côte d'Ivoire)
CSR	Corporate social responsibility
CTA	Cocoa Transformation Agenda
CTA	Technical Centre for Agricultural & Rural Cooperation
FBS	Farmer business school
FFS	Farmer field school
FIFFA	First Investment Financial Assistance
FO	Farmer organization
GAP	Good agriculture practice
GIZ	Gesellschaft für Internationale Zusammenarbeit (German Society for International Cooperation)
IITA	International Institute for Tropical Agriculture
LBC	Licensed buying companies
LBA	Licensed buying agents
MIFED	Microfinance and development
MOU	Memorandum of understanding
NCDC	National Cocoa Development Committee
OISL	Opportunity International Savings and Loan
ONCC	National Office for Cocoa and Coffee
SOCODEVI	Société de Coopération pour le Développement International
WCF	World Cocoa Foundation

Acknowledgements

The MSI team would first like to thank our partner Ipsos and their team for conducting the household survey across all four countries. We would like to thank Rob Petrin, Meghann Jones, Mary Choi and their team for the diligent work processing the vast amount of survey data and working to provide us with the needed quantitative findings for this evaluation. In addition, we would like to thank the staff at the Ghana WCF office and technical partners in the other three countries who supported the evaluation team during the field work, provided logistical support and shared their knowledge about the CLP program and the cocoa industry.

We appreciate all of the time and effort the partners and farmers gave to this evaluation. We would also like to thank the cocoa farmers who took time out of their days to talk with us and share their stories of cocoa farming. We would like to acknowledge the technical and government partners who sat with us for hours explaining their contributions to CLP I and their experiences with the cocoa sector.

We greatly appreciate WCF giving us the opportunity to work on this evaluation, as well as providing support and understanding throughout the whole process. And lastly, we would like to thank the MSI home office staff, which provided support throughout the process.

Executive Summary

Phase I of the Cocoa Livelihoods Program (CLP I) was a five-year program in Cameroon, Côte d'Ivoire, Ghana and Nigeria, managed by the World Cocoa Foundation (WCF) with a consortium of six international NGOs. It was launched in February 2009 and was completed in January 2014. Together with CLP Phase II (2014-2018) the goal was to double the incomes of 200,000 smallholder cocoa-farming households. CLP I had three primary approaches to reach this goal: supporting farmer organizations to improve cocoa farmers' negotiating position when selling their crops, providing productivity training to help farmers improving their cocoa yields, and providing farm management training and support for farmers to diversify and improve their competitiveness.

The purpose of this evaluation was to assess the effectiveness of CLP Phase I project interventions and to inform the design and implementation of the second phase of the program. The primary audiences for this evaluation are the World Cocoa Foundation, funding partner and the technical and industry partners who will implement the second phase of CLP. This evaluation assesses the impact of CLP's key interventions, including training in good agricultural practices (GAP) provided through farmer field schools (FFS) and training in agricultural entrepreneurship through farmer business schools (FBS), microcredit programs to improve access to inputs, business service centers (BSCs), and the creation and strengthening of farmer organizations (FOs). The key outcomes studied in this evaluation are the impacts of the program on cocoa yields, farmers' incomes and farmers' investment decisions.

Methodology

The findings of this evaluation are based on qualitative and quantitative research methods. A qualitative research team conducted over 90 semi-structured interviews with key informants, groups of project beneficiaries and implementers in the four target countries, and reviewed program documents and performance monitoring data. A quantitative research team conducted a household survey of 2,770 cocoa farmers in the four countries; it contained questions on several topics, including demographic and family characteristics, cocoa-farming practices, cocoa yields, production of other crops and nonagricultural income. This survey was based on a baseline survey completed for the project in late 2010.

Key Findings

Evidence from the evaluation of CLP I suggested that the program had a positive effect on the cocoa sector in the four target countries. One of the most important effects that was observed were the changes at a systematic level. When prompted to state the most positive impacts of CLP I interventions, several CLP staff members and implementing partners agreed that CLP I's biggest impact was in creating an important common platform to bring together all the stakeholders in the cocoa sector. For the first time, cocoa exporters and other industry partners, who act primarily as competitors in the cocoa market, worked together through matching grants to improve farmers' yields and incomes. In addition, national extension agencies in three of the four target countries (Ghana, Nigeria and Cote d'Ivoire) adopted the training methodology promoted by CLP I. While private input suppliers began to develop competing packages to sell inputs to farmers on credit, which was spurred by a microfinance program developed by Technoserve.

Beyond these impacts, CLP I also delivered results under the three project objectives: 1) improving efficiency of cocoa marketing, 2) increasing farmer productivity and, 3) improving cocoa farm management. These results are discussed below.

Cocoa Marketing

CLP I aimed to increase the price farmers received for cocoa by helping them form and strengthen farmer organizations/cooperatives. In all countries, except Ghana, WCF worked with its partner, SOCODEVI, to strengthen existing farmer organizations through intensive training and coaching. The evaluation team found evidence that SOCODEVI's approach of closely coaching these cooperatives was an appropriate methodology to build the capacity of these organizations given the challenges they faced, such as, building professional management systems, avoiding embezzlement, and building trust among their members. Monitoring data provided by SOCODEVI suggested that this approach had succeeded in expanding membership in farmer organizations. The membership of the 36 farmer organizations trained by SOCODEVI was up 68% with the largest gains being in Nigeria where membership was up by 183%.

In Ghana, there was not an existing history of farmer organizations in the country before the program began, so CLP I worked instead with the extension agents to use training groups as a basis to form informal farmer groups. The evaluation team found evidence that these efforts had successfully created many small farmer organizations across the country, including one association which had successfully aggregated 60 small FFS training groups into a formal organization with 1,800 members.

In group interviews with farmers, the evaluation team found evidence that membership in farmer organizations had helped farmers get a fair price for their cocoa. Farmers in Côte d'Ivoire, Nigeria, and especially Cameroon reported that they lost significant income by selling to private buyers who either offered a lower price or used tactics such as falsifying their scales or paying for only a portion of the cocoa on the pretext that the quality was too low. By working through a cooperative, farmers reported that they could avoid these losses in income.

Quantitative data from the follow-up household survey did not provide conclusive evidence on how these micro trends have contributed to the regions that CLP I was implemented in. Overall, the reported membership of the cooperatives more than doubled in Nigeria and Ghana, with a smaller increase in Côte d'Ivoire. It is likely that CLP I interventions contributed to the growth of the cooperatives in these countries, however it is difficult based on the evidence to separate the impact of CLP I from other factors. Notably, during the same period, the evaluation team found that cocoa exporters had significantly increased their direct support to cooperatives through corporate social responsibility (CSR) and sustainability programs, which also increased the support that these groups received. In contrast to the increases in membership in Nigeria, Ghana and Côte d'Ivoire, overall membership in Cameroon declined from 2010 to 2013, suggesting that the increases in membership in farmer organizations was supported by the CLP training, but that the program may not be driving the overall change in the intervention regions.

Farmer Productivity

The centerpiece of CLP I's intervention was a package of training in cocoa productivity called Farmer Field School (FFS), which is based on a methodology of hands-on experience and demonstration. Prior to the beginning of CLP I, the International Institute for Tropical Agriculture (IITA) piloted the FFS methodology, and CLP I successfully brought FFS to scale by training 138,000 farmers. Beyond the farmers CLP I reached directly, the program also led to an improvement in the methodologies used by national extension agencies. CLP I delivered training through the national extension agencies in three of the four target countries (Ghana, Nigeria and Côte d'Ivoire) starting in 2012, and in each country the extension agency enthusiastically adopted these training methods as their dominant approach to training farmers. This marked a significant change in the services these extension agencies offered before CLP I. In Côte d'Ivoire, for example, key informants reported that the primary service offered by the national extension agency prior to CLP I was to establish demonstration plots, which were not accompanied by any hands-on training. By contrast in the FFS methodology, farmers divide a plot into the old and new methods and spend 6-9 months testing the

recommended farming methods together so they can see the impact of the new farming methods in contrast to the old. In Nigeria, the government bought into the training system and signed a MOU with WCF to provide \$1.2 million to scale up the CLP package (FFS, FBS and FO support) to 70,000 farmers in five additional States between 2014 and 2015, after CLP I had ended.

In group interviews in all countries, farmers reported improving their agricultural practices and consequently improving their cocoa yields and income after receiving FFS training. Farmers typically reported doubling their cocoa yields after adopting the recommended practices. These increases were surprisingly large, since many of these farmers did not report increasing their use of fertilizers or replanting with hybrid trees. Interviews with industry partners suggested that a 25 percent increase in yields was expected from improved farming practices, while an increase use of fertilizers and hybrid tree varieties would be necessary for increases in the range of 100-150 percent. However, the large gains seem plausible in the context of the data from the 2013 household survey¹, which showed large short-term fluctuations in cocoa yields. This evaluation found that the yields of a typical farmer changed by several hundred kilograms per hectare from the baseline survey in 2010. In this context of large short-term fluctuations, it is possible that even if the average gains from improved farming practices are relatively small, the increases for individual farmers may be very large.

Group interviews suggested several avenues by which cocoa farmers realized large gains in productivity by adopting the practices taught in FFS training. Most importantly, many farmers reported improving their crop protection practices (i.e. using pesticides and fungicides), which significantly decreased their losses from pests and fungi. The evaluation team also found evidence that in many cases, farmers already had good soil quality and high-yielding cocoa trees, but were getting yields far below their potential because of poor farm maintenance. In Ghana, for example, one representative of the national extension agency reported that 60 percent of cocoa trees in the country were already hybrids. In this context, it appears that by improving their farm maintenance and crop protection practices, farmers may have been able to realize larger increases than expected.

While the qualitative evidence from group interviews showed that FFS had an unexpectedly large impact on the yields of farmers who successfully implemented the recommended practices, data from the follow-up household survey did not definitively show whether the yields of all farmers who received FFS training increased. Depending on the year of training, farmers had a change in reported yields which was above or below the average of farmers who didn't receive training, but in most cases, these relationships were not statistically significant. Because of the wide variation in farmers' reported yields, it appears that the real effects may have been obscured by short-term fluctuation.

In addition to productivity training, CLP I worked with its partner, Technoserve, to pilot a microcredit program to expand access to crop protection products and inorganic fertilizers. During CLP I, the program operated on a relatively small scale, reaching 5,322 farmers in Ghana and 4,821 in Côte d'Ivoire. However, the evaluation team found evidence that Technoserve built the institutional infrastructure to expand this system and make it self-sustaining. In Ghana, Technoserve built a partnership with Opportunity International Saving and Loans (OISL) to extend credit to farmers trained in FFS to purchase pesticides and fertilizers. In Côte d'Ivoire, Technoserve built relationships with exporters, cooperatives, and input suppliers to share the risk of loans for inputs among all of the stakeholders. Aside from building this infrastructure, a major finding of the evaluation was that CLP I's work in this area appears to have stimulated a market for similar credit input schemes. Numerous cooperatives interviewed in Côte d'Ivoire reported buying pesticides directly from input suppliers on credit, through packages that were unavailable before CLP I. Thus, on the one hand, this program

¹ The 2013 household survey refers to the survey conducted for this evaluation that was administrated by Management Systems International & IPSOS in October & November 2013.

appears to have stimulated a thicker market for crop protection products, while building the infrastructure to begin supplying fertilizers on a larger scale, since fertilizers are higher cost and still too high risk for input suppliers to bear the risk themselves.

Farm Management and Diversification

The final major component of CLP I's programming was to provide training in farm management business practices. WCF's partner, GIZ provided a weeklong training program called Farmer Business School (FBS), which reached 175,286 farmers across the four countries. As in the case of FFS training, the evaluation team found evidence that this intervention had created systemic change in national extension agencies. In Ghana, the Cocoa Board (COCOBOD), which delivers extension services to cocoa farmers, integrated the FBS training into their standard training cycle, along with FFS. In Côte d'Ivoire, it was similarly integrated into the national extension agency's services. This appeared to be an important impact, as many key informants believed that FBS training provided an essential complement to the technical training provided by FFS. Farmers in group interviews frequently reported that they had begun treating cocoa farming as a business and analyzed their investment decisions more closely.

FBS training also encouraged farmers to diversify their farms in order to mitigate risk, smooth income, and make their farms more competitive. In group interviews in all countries, farmers reported that they had increased production of other crops after FBS training. However, the household survey did not provide strong evidence to determine whether there was general trend for farmers to increase the numbers or quantities of other crops grown.

Key Lessons Learned and Recommendations

The evaluation team identified several lessons learned and recommendations which may inform the implementation of the second phase of CLP. These were:

1. Access to fertilizers and hybrid cocoa varieties remains a key constraint for cocoa farmers

The most common feedback farmers gave in group interviews was that the FFS training taught them good agricultural practices and tried to give them priority access to planting material, however there was never enough planting materials (i.e. hybrid seedlings and fertilizer) available, so the farmers couldn't implement these learned practices. In the case of hybrid varieties, the government in each country supplies planting materials through a national research organization. While FFS trainings have created demand for these varieties, farmers and key informants in all countries reported that the supply was insufficient to meet the demand. While this supply bottleneck appeared to be the main constraint, the evaluation team found evidence that CLP's approach to setting up community nurseries had improved the efficiency of distribution. Fertilizer use remained low in all countries, primarily because of its high cost relative to other agricultural inputs, but also due to late distribution by governments to farmers. Key informants from input suppliers, microfinance institutions, and cocoa exporters confirmed that the cost of fertilizers is too high for either farmers or any one private firm to bear the risk in most cases. The multiparty risk-sharing arrangements developed by Technoserve could offer a market solution to expand supply of fertilizers.

Recommendations:

- Coordinate CLP II activities with other current efforts to increase the supply of improved planting materials. This includes working with government research entities to increase the availability of hybrid pods and seedlings, and more timely fertilizer distribution.
- Expand the system of creating community/group nurseries to distribute cocoa pods with farmers.
- Expand credit schemes for fertilizers and other inputs - paying close attention to the profitability of the investment for farmers.

2. Other stakeholders in the cocoa sector play a major role improving cocoa productivity.

The evaluation team found that private firms, national governments, and certification organizations are all engaged in large scale efforts to improve the productivity of the cocoa sector in West Africa. Exporters reported that they had major corporate social responsibility and sustainability programs that extended services to farmers in addition to their activities under matching grants with WCF. In all countries except Cameroon, national extension agencies also provided training services to farmers across the country. Likewise, every farmer organization the evaluation team interviewed had either become certified or was in the process of becoming certified. Despite this profusion of cocoa sector interventions, CLP I appears to have made an impact on the sector, improving training curriculum in all four countries and coordinating the activities of cocoa exporters and national extension agencies. For example, the evaluation team found that FFS trainings had been a prerequisite for farmers to join some cooperative and seek certification. Many of the nine exporters that held matching grants under CLP I also used the FFS and FBS training methods for their matching grants, which has further harmonized training efforts. In interviews with CLP I staff, it appeared that the program's coordinating role had come about somewhat unintentionally; the original goal of the program was to deliver services directly to farmers, but the project took on a coordinating role with exporters and national extension agencies in order to make implementation as efficient as possible. For the second phase of this project, WCF can expand on this role, focusing on coordinating the efforts of all the stakeholders to improve cocoa productivity.

Recommendations:

- Make harmonization of cocoa sector interventions an explicit goal of CLP II.
- Consider including farmer organization representatives on the CLP II steering committee to provide feedback and share insights on the challenges farmers face.
- Work to integrate FBS training into the training curriculum of the national extension agencies and certification organizations.
- Create partnerships with certifying organizations to coordinate efforts, helping to eliminate training overlap.

3. CLP I's monitoring and evaluation system didn't sufficiently capture data on key outcomes.

This evaluation was limited in its ability to assess the final impact on the intended outcomes related to cocoa productivity. These outcomes were: (1) improving farmers' agricultural practices, (2) increasing cocoa yields, and (3) increasing cocoa farmers' incomes. The project collected data on these variables through a series of household surveys---a baseline survey conducted by Mathematica, a midterm survey conducted by Dalberg, two internal surveys, and this final survey. Because the three midterm surveys were based on a different instrument and a much small sample size, it was only possible to use the baseline and final surveys to evaluate change in key outcomes. The module of these surveys that covered good farmer practices gathered data on use or nonuse of a series of agricultural practices, but in most cases, large majorities of farmers report applying each practice. These surveys did not capture data on the quality of application of each practice, which made it difficult to track improvements in farming practices. Data on yields was collected through a module in the survey in which farmers report their farm size and the volume of cocoa produced in the last 12 months. Analysis of the data from this survey and the baseline survey found that large short-term fluctuations in reported yields made it impossible to assess the long-term trend in yields and the impact of CLP I interventions on yields. It is not clear to what extent the short-term fluctuation in self-reported yields reflects a real trend or is due to measurement error. Data on income was subject to the same short-term fluctuation, which made it impossible to draw statistically significant conclusions. For future studies, CLP II could either adopt a more rigorous method of measuring yields, or if cost is prohibitive, it may be most effective to focus

resources on collecting data on agricultural practices. Options for improving data on yields could include collecting data more often, measuring cocoa plantations, measuring crop cuttings, or developing measures to validate the cocoa data.

Recommendations:

- Develop indicators to measure the quality of farmers' agricultural practices which can be collected through farm visits and working in collaboration with GAP trainers. Farm visits and observations should be planned around the cocoa season and should take place at different stages in the season to be able to capture all practices as they are being implemented.
- Redesign monitoring and evaluation system for tracking key outcomes, such as yield and income, based on a cost assessment of different measurement systems.
- Work to develop standardized M&E system across the cocoa value chain to be able to measure each critical point in the chain. This should be developed and implemented through partnering with key industry partners and government agencies when possible.

4. Farmer Field School training is most effective when it provides hands-on experience

Evidence gathered in this evaluation suggested that FFS training was most effective when it provided the maximum amount of hands-on experience and demonstration for farmers. In one important example, FFS trainers reported that correctly pruning cocoa trees was a difficult practice to teach because it is counterintuitive for many farmers that removing branches could ultimately increase yields. FFS was most effective where the farmers were taught to do this correctly in the field and then had a chance to see the difference it made in the final harvest. While the evidence suggested that this was the main strength of FFS training, there were some indications that a change in the implementation of FFS training partway through the program could have weakened the focus on demonstration and practical experience. The training cycle was reduced from nine months to six months in every country except Ghana, which meant that the training was no longer aligned with the harvest cycle. Both farmers and trainers in all countries where this change was made, reported that this made it difficult to teach some practices and meant that farmers didn't necessarily see the final result. The evaluation team also found evidence that in some cases the FFS training cycle didn't always adapt to local needs. For example, in Southwest Cameroon, farmers reported that it rained so frequently that drying their cocoa in the sun was not possible, but the FFS training curriculum recommended sun drying.

Recommendations:

- Align FFS training cycle with the cocoa growing season to the extent possible.
- Adapt training curriculum based on local needs and trainers' feedback.

CLP Phase I Program Background

CLP Program Overview

In February 2009, the World Cocoa Foundation (WCF) launched the Cocoa Livelihoods Program (CLP) with a consortium of six other international organizations. The goal of the first phase of the project, from February 2009 to January 2014, was to double the incomes of 200,000 smallholder cocoa-farming households in Côte d'Ivoire, Ghana, Nigeria and Cameroon.² To achieve this, WCF pursued three objectives: 1) Improve cocoa marketing efficiency; 2) Improve cocoa production efficiency and quality at the farm level; and 3) Improve farmers' competitiveness on diversified cocoa farms.

These objectives were based on the project's core hypotheses about the cocoa sector in West and Central Africa, which can be summarized in three parts:

1. Farmers receive low prices for cocoa because they don't understand cocoa quality requirements and sell primarily to itinerant buyers with whom they have a weak negotiating position.
2. Low cocoa yields are due to farmers' limited knowledge of improved agricultural techniques and lack of access to key agricultural inputs and high-yielding cocoa varieties.
3. Farmers get low or even negative returns on their investments in cocoa farming because they don't have the business skills necessary to manage their farms as profitable enterprises.

CLP Technical Partners	
Original Partners	Added Partners ³
1. World Cocoa Foundation	1. Cocoa Board (COCOBOD), Ghana
2. International Institute for Tropical Agriculture (IITA) (Departure 2012)	2. National Agency for Rural Development (ANADER), Côte d'Ivoire
3. GIZ	3. Agricultural Development Program (ADP), Nigeria
4. SOCODEVI	
5. TechnoServe	
6. Agribusiness Systems International (ASI), ACDI/VOCA	

Intervening in these three areas, CLP I aimed to:

1. Increase the price farmers receive for cocoa by 10–15 percent by improving farmers' negotiating position;
2. Increase farmers' yields from a baseline of 350 kg per hectare to 800–1000 kg per hectare by the end of the project; and
3. Help farmers generate additional income by growing other crops.⁴

The third goal of increased diversification was also associated with objectives of mitigating the risk of relying on a single crop and reducing food insecurity by promoting additional food crop production.

CLP I's interventions varied in each country, but included core activities under each objective. For the first objective, the project provided training to farmer organizations to attract new members and improve their governance and business performance. For the second, the project trained farmers in good agricultural practices (GAP) using a methodology called Farmer Field School (FFS) and piloted programs to increase access to agricultural inputs and high-yielding cocoa varieties. For the third, the project trained farmers in farm

² Liberia was originally included as a target country, but was dropped at the beginning of the program.

³ The three added partners took over GAP implementation when the partnership with IITA ended in 2012. In Cameroon, original partner SOCODEVI was given the additional responsibility to implement GAP.

⁴ The CLP I theory of change is articulated in WCF's proposal for CLP.

management through a Farmer Business School (FBS) and set up business service centers (BSCs). In some cases, activities contributed to multiple objectives; for example, microcredit programs were designed to improve access to inputs and increase yields, but in Côte d'Ivoire this program was implemented through farmer organizations, which helped to build their capacity.

CLP I brought together diverse stakeholders to collaborate throughout the program. The program was funded by the Bill & Melinda Gates Foundation, along with several industry partners.⁵ While WCF was responsible for the overall management of CLP I, program activities were delivered by the other consortium members (see text box above) and by nine industry partners who received matching grants.⁶ Matching grant recipients bore a minimum 50 percent of the costs of their interventions. At the beginning of the project, the CLP consortium was made up only of international organizations, but in 2012, IITA left the consortium and CLP partnered with several government extension agencies.

Cocoa sector context and CLP Phase I by country

Cocoa is a major agricultural crop in all four of the target countries. Together they produce 65 percent of the world's cocoa,⁷ which is grown by approximately 2 million smallholder farmers, the majority of whom have farms of less than 2 hectares.⁸ However, the organization of the cocoa sector differs significantly across the four countries. While the government of Ghana provides extensive services to farmers and sets producer cocoa prices, the government of Cameroon has limited involvement in the sector and does not influence prices. The level of organization of farmers also varies: Farmer organizations are relatively well developed in Côte d'Ivoire, but new to Ghana. These differences are summarized in Figure 1. The section below describes the specific context in each country and how CLP I delivered their activities in each country.

Figure 1: Context in CLP I Countries

Country	Share of world cocoa production	Government services	Price structure	Farmer organizations at baseline
Côte d'Ivoire	35% ⁹	Extension, free high-yielding seedlings	Minimum price set by government	Most developed farmer organizations, 30% membership ¹⁰
Ghana	20%	Extension, free high-yielding seedlings, free/subsidized inputs, disease control, etc.	Fixed by government	Few, small farmer organizations, mostly informal, 5% membership
Nigeria	5%	Extension, sell high-yielding seedlings	No price controls	Weak farmer organizations due largely to many years of relative inactivity
Cameroon	5%	Sell high-yielding seedlings	No price controls	Very weak farmer organizations, 2% membership

⁵ Industry partners that contributed funding were: Kraft Foods, Mars Inc., ADM Cocoa, Blommer Chocolate Company, Guittard Chocolate Company, Petra Foods Ltd., See's Candies Inc., Starbucks Coffee Company, Transmar Commodity Group Ltd., The German Ministry for Economic Cooperation and Development (BMZ) and the Sustainable Trade Initiative (IDH).

⁶ The matching grant recipients were: Ecom Agro Industry Corp. Ltd, Mars Inc., Armajaro Trading Ltd., Cargill, Olam International Ltd., Noble Resources, ADM, Barry Callebaut, and Kraft Foods.

⁷ ICCO Quarterly Bulletin of Cocoa Statistics, Vol. XXXIX, No. 3, Cocoa year 2012/13

⁸ CLP I Proposal

⁹ Market shares are based on the 2010/2011 season, ICCO *Quarterly Bulletin of Cocoa Statistics*, Vol. XXXIX, No. 3, Cocoa year 2012/13.

¹⁰ Membership rates are taken from CLP's 2009 proposal; the 2013 survey finds these figures have changed, which is discussed in the findings for evaluation question 7.

Côte d’Ivoire:

Côte d’Ivoire is the largest cocoa producer in the world. Given the strategic importance of the sector, both the government and cocoa-exporting firms are major players. The government abandoned price controls in 1999, but established the Council for Coffee and Cocoa (CCC) in 2011 to regulate the cocoa sector and set a minimum price for cocoa producers. The CCC also oversees the Quality, Quantity and Growth project to improve production, and the National Agency for Rural Development (ANADER) provides agricultural extension services to farmers. Though the majority of cocoa farmers still sell their cocoa to itinerant buyers, farmer organizations—cooperatives—are better developed in Côte d’Ivoire than in the other three countries. Cooperatives typically have a relationship with an exporter that provides short-term credit to the cooperative to collect a portion of their members’ cocoa production and sell it to the exporter. In this context, CLP I used the government and cooperatives as their main points of entry. Though FFS/GAP training was managed by IITA at the beginning of the project, the program partnered with ANADER in 2012 to deliver these trainings. GIZ worked with ANADER from the beginning of the project to deliver FBS training. SOCODEVI worked to professionalize 24 cooperatives through training and coaching, and TechnoServe used cooperatives as a platform for a microcredit program to deliver inputs on credit to farmers. CLP I also established four BSCs, one of which was housed in a cooperative.

Ghana:

Ghana is the second-largest cocoa producer in the world. The cocoa sector is closely regulated by the Ghana Cocoa Board (COCOBOD) which buys cocoa through 26 licensed buying companies (LBC) and exports it around the world. The government fixes cocoa prices, provides disease control services and subsidizes pesticides and fertilizer; however according to key informants at COCOBOD they are working to phase out subsidies over the next few years.¹¹ The government’s new strategy emphasizes extension services, drought and disease research and the use of fertilizers and insecticides. CLP I partnered with COCOBOD to sponsor and train extension agents to deliver GAP and FBS trainings. Since the extension agents work with the same communities for three years, CLP I also used GAP training groups as the basis to create small informal farmer organizations and as a first step toward establishing formal associations. GAP training groups have also served as solidarity groups to receive loans from microfinance institutions. TechnoServe provided a package of inputs to these groups on credit through the input provider Callighana and the microfinance institution, Opportunity International Savings and Loan (OISL). ASI supported a Business Service Center (BSC) that developed a similar arrangement with the input dealer, B. Kaakyire Agro Chemicals Ltd. and OISL. CLP I also implemented a pilot project, Digital Green, in Ghana using low-cost video technology to deliver interactive training on good agricultural practices.

Nigeria:

Nigeria is the fourth-largest cocoa producer in the world. Nigeria eliminated price controls in 1986, but set up the National Cocoa Development Committee (NCDC) in 1999 to promote cocoa production and improve the quality of cocoa. Nigeria is currently implementing its Cocoa Transformation Agenda (CTA), which aims to expand cocoa production to at least 1 million hectares in the next four years. As part of this agenda, the government’s Agricultural Development Program (ADP) is providing agricultural extension services to cocoa farmers. CLP I sponsored extension agents to deliver GAP training and GIZ trained some extension agents to deliver FBS, but the two trainings were delivered independently. CLP I’s partnership with the government is set to expand; the Nigerian government signed an MOU in 2013, providing \$1.2 million to scale up GAP and

¹¹ This was confirmed in new reports. E.g., Kpodo, Kwasi, September 5, 2013, “Ghana cocoa regulator plans ending fertilizer subsidy,” Reuters. <http://news.yahoo.com/ghana-cocoa-regulator-plans-ending-fertiliser-subsidy-120145400--finance.html>

FBS training and FO support to 70,000 farmers in five additional states in 2014–2015. Farmer organizations in Nigeria, referred to as unions, lost much of their influence in the cocoa sector when it was liberalized because of their connection with the government, but SOCODEVI worked to rebuild the old unions. Unlike the other three countries, CLP I was unable to provide financial services directly to farmers in Nigeria because there were no microfinance institutions interested in partnering with the program.

Cameroon:

Cameroon is the fifth-largest cocoa producer in the world. Since the cocoa sector was liberalized in the early 1990s, the government has had limited involvement in the sector and the National Office for Cocoa and Coffee (ONCC) has little power to regulate the market. Because of the limited government involvement in the sector during the project, CLP I delivered FFS and FBS training through community facilitators. After IITA left the project, facilitators were trained and paid directly by SOCODEVI to deliver FFS training, but managed by agricultural cooperatives and master supervisors with the Ministry of Agriculture. FFS and FBS training are not coordinated in Cameroon, as GIZ selects and supervises different trainers to deliver FBS training. Like Nigeria, cooperatives were greatly weakened when the market was liberalized, but SOCODEVI worked to build or rebuild the capacity of six cooperatives. SOCODEVI established a growth fund with the microfinance firm, FIFFA, to provide a credit line to cooperatives, but in 2012, FIFFA went bankrupt and froze their funds. TechnoServe continued to provide more limited credit to cooperatives. Five BSCs were established and hosted by community-based village banks working with Micro Finance and Development (MIFED).

CLP Phase I Accomplishments to Date

The largest portion of beneficiaries of CLP I were recipients of GAP and FBS training. According to WCF's performance monitoring data as of November 2013, approximately 138,000 farmers received GAP training, and 175,286 farmers received the FBS training. In the Digital Green pilot in Ghana, 17 videos were produced and screened in 37 communities. According to CLP I data, 25 percent of GAP trainees were women, varying from 11 percent participation in Côte d'Ivoire to 35 percent in Ghana. On average, 25 percent of the beneficiaries of the FBS training were women, with the greatest participation in Nigeria at 36 percent and the lowest in Côte d'Ivoire at 10 percent.

CLP I's interventions that strengthen farmer organizations and provided inputs on credit were smaller in scale during the first phase of the project. TechnoServe reported that they delivered inputs on credit to 5,322 farmers in Ghana and 4,821 in Côte d'Ivoire. Having built partnerships with three financial institutions, six input suppliers, and six exporters, TechnoServe projects that they can scale up the program to reach 50,000 farmers per year by 2015.¹² SOCODEVI reported that they supported 36 FOs across Nigeria, Cameroon, and Côte d'Ivoire, with a combined membership of 18,142. Thirteen BSCs have been established and are delivering inputs, finance and technical information services to cocoa farmers.

Monitoring data and prior studies commissioned by WCF provide preliminary evidence that CLP I's activities have led to improved outcomes for its beneficiaries. SOCODEVI reported that membership in the cooperatives they supported increased by 51 percent. According to a midterm impact assessment,¹³ 70 percent of farmers reported applying four or more practices taught in GAP training and the same study found that the portion of trainees that grew other crops to sell in addition to cocoa increased from 50 percent to nearly 80 percent in Ghana. However, this proportion did not change significantly in Côte d'Ivoire or Nigeria. In addition, although increases in yields and income happen over time, the midterm impact assessment found that the self-reported yields of a small sample of farmers increased by 25–54 percent from 2009 to 2012 but did not control for any exogenous factors.

¹² TechnoServe presentation to WCF Steering Committee, November 2013.

¹³ Dalberg, (Sept. 2012), "Impact analysis on CLP I"

Evaluation Purpose, Scope, Methodology and Limitations

Purpose and Audience

The purpose of this evaluation is to assess the effectiveness of CLP I project interventions and to inform the design and implementation of the second phase of the program. This evaluation assesses the impact of CLP's key interventions, including training in GAP and agricultural entrepreneurship, credit risk-sharing schemes, BSCs, access to inputs and the creation and strengthening of FOs. The key outcomes studied in this evaluation are changes in the cocoa yields and incomes of cocoa farmers. In addition to these primary outcomes, the evaluation considers how CLP I activities impacted farmers' investment decisions and how the program impacted women.

The primary audiences for this evaluation are the World Cocoa Foundation and the technical and industry partners that will implement the second phase of CLP. Based on the findings and conclusions, it will provide specific recommendations and lessons learned that will allow the CLP II partners to improve program activities in the second phase. Because the second phase of CLP will focus on increasing cocoa yields, special attention is paid to identifying constraints farmers face in increasing their cocoa yields and improvements that can be made in the existing project activities to alleviate these constraints. In response to the Bill and Melinda Gates Foundation's increasing emphasis on improving food crop production, the evaluation also provides situational analysis on current food crop production practices and assesses the impact of CLP activities on diversification.

This evaluation is also intended for the donors and industry partners that funded the first phase of CLP. By assessing the effectiveness of CLP activities, this evaluation ensures that the technical and government partners implementing program activities are accountable for the effectiveness and efficiency of their interventions. The WCF also envisages that the findings on the relative performance and cost-effectiveness of different approaches will be used by government agencies and donors to formulate other policies and interventions related to cocoa production and marketing.

Evaluation Questions

The terms of reference for this evaluation included eight questions to be addressed through the evaluation. These questions were formulated based on the original objectives of CLP I and on feedback received from members of CLP's Steering Committee. The evaluation questions are:

1. Did CLP farmers record increases in yield of cocoa during the implementation of CLP I? If yes, to what extent can increases in productivity and income of assisted cocoa farmers be attributed to CLP I activities? And if not, why? (e.g., no fertilizer, no credit, no planting material, trees too old, etc.)
2. Have farmers' levels of income changed since CLP Phase I? If yes, what are the critical factors (in order of importance) that have impacted the income levels of assisted farmers? How has this new income been used (e.g., sending kids to school, cocoa farm investments, food, etc.)?
3. To what extent have different approaches in training farmers improved adoption rates and productivity of farms in targeted communities? Which approaches are more effective? What are the constraints and interventions to address them?
4. How has CLP Phase I impacted farmers' access to improved planting material, cocoa finance, cocoa inputs (e.g., fertilizers, agrochemicals)? What innovations (e.g., Business Service Centers) are most efficient with getting services down to the farm level?
5. What are the unintended positive and negative impacts of CLP Phase I interventions on cocoa and food crop production? What are the spillover effects of the CLP cocoa intervention on other crops (e.g., GAP training's effects on other crops, access to finance?)?
6. How has CLP I influenced farmers' choices with regard to on-farm investments? What are the considerations for farmers to continue cocoa farming or diversify into other crops?

7. How have program activities focused on professionalizing farmer organizations improved farmers' access to services and cocoa sales?
8. Have CLP Phase I interventions impacted women significantly and bridged gender gaps in access to training, finance and inputs, and participation in farmer organizations? If yes, how?

Methodology

The findings of this evaluation are based on qualitative and quantitative research. A qualitative research team conducted semi-structured interviews with key informants and groups of project beneficiaries and implementers in the four target countries and reviewed program documents and performance monitoring data. A quantitative research team conducted a survey of cocoa farmers in the four countries that included questions related to demographic and family characteristics, cocoa farming practices, cocoa yields, production of other crops and nonagricultural income. This survey was based on a baseline survey completed for the project in 2009. The qualitative and quantitative teams synthesized their findings through a collaborative process which included testing hypotheses formed through the qualitative research with quantitative analysis; explaining associations found in quantitative analysis with qualitative data; and designing quantitative analysis methods based on qualitative findings (e.g., selecting the correct covariates for regression models and identifying confounding factors).

Qualitative Research

The qualitative research team completed semi-structured interviews with 29 key informants in Ghana, 32 in Côte d'Ivoire, 19 in Nigeria, and 17 in Cameroon. The team identified five groups of key informants to interview: 1) technical partners, 2) government partners, 3) industry partners, 4) microfinance institutions and 5) farmer organizations. Several of these groups were heterogeneous; for example, the government partners group included both the senior-level government officials and extension agents. After identifying the groups and positions of key informants, the evaluation team worked closely with the WCF to arrange interviews. The goal of these interviews was to gather contextual information about the cocoa sector in each country and to identify factors that affect the outcomes of CLP I's interventions. The evaluation team also held group interviews with beneficiary farmers in all four countries. The team interviewed seven groups of farmers in Cameroon, five in Côte d'Ivoire, six in Ghana, and three in Nigeria. The evaluation team worked closely with WCF to select communities with a sample of both strong and weak performing farmer organizations. The purpose of these discussions was to gather narrative information about the beneficiaries' behavior, the constraints they face, and their perceptions of the effectiveness of project interventions.

Quantitative Research

The quantitative research team completed a household survey, which was a follow-up to the survey completed for the baseline study of the CLP project. In addition to the baseline survey, there were also three biannual impact surveys conducted by Dalberg and WCF. Prior surveys are summarized in Figure 2.

Figure 2: Household Surveys for CLP I

Survey	Implementer	Dates	Sample size
Baseline	Mathematica Policy Research	September 2010 – March 2011	2300
Biannual impact survey	World Cocoa Foundation	August 2011	650
Biannual impact survey	World Cocoa Foundation	February 2012	700
Biannual impact survey	Dalberg Global Development Advisors	August 2012	492 (and 51 farm inspections)
2013 survey	Management Systems International & IPSOS	October 2013 – November 2013	2770

This survey covered a sample of 2,770 farmers across the four countries, which used the baseline survey as a sampling frame. In order to ensure maximum comparability between baseline and follow-up, the survey attempted to re-contact farmers surveyed and achieved a 62 percent re-contact rate (see figure 3). The target sample size was 10-15 farmers per village on average. When drawing the sample, farmers were chosen at random from the baseline sample. In order to maintain targeted per-village sample sizes replacement sample was chosen when baseline farmers had deceased or otherwise could not be located. Selection of replacement farmers was done at random, and retained the oversampling of female farmers applied at baseline. This sample was intended to be a representative sample of farmers in the four countries covering both farmers that did and did not receive interventions from CLP I.

Figure 3: 2013 Household Survey Sampling Plan

SAMPLE	CDI	GHANA	CAMEROON	NIGERIA	TOTAL
BASELINE ACTUAL	968	995	426	400	2789
2013 SURVEY TARGET	991	1029	435	385	2840
Baseline Recontact	931	949	435	325	2640
Dalberg	60	80	---	60	200
2013 SURVEY ACTUAL	955	1004	427	384	2770
Baseline Recontact	649	605	238	235	1727
Dalberg	49	107	0	65	221
Replacement	257	292	189	84	822

The survey gathered information on demographic characteristics; cocoa farming practices, use of inputs and cocoa productivity; income from cocoa, other agricultural products and nonagricultural income; and exposure to CLP I interventions. In addition to comparing overall change in the characteristics of cocoa-farming households from baseline to the end of CLP I, the quantitative research team analyzed the differences between farmers who did and did not receive CLP I interventions using a series of regression models to determine if there are associations between receiving CLP I interventions and improvements in key outcomes such as adoption of good agricultural practices, increased cocoa yields and income, and increased diversification. For additional information on the survey methodology see Annex E: Analysis of Data from 2013 Household Survey.

Limitations

Qualitative research for this evaluation had several constraints. Notably, there was likely to be a high degree of selection bias in the sampling of beneficiary farmers for the group interviews. WCF or a technical partner selected cooperatives or communities for the group interviews in each country and then the cooperative or extension agency selected farmers for the discussion. In Ghana, the groups were smaller, so the entire group normally came to the group interview. This method introduced three levels of selection bias: first, technical partners may select the best-performing cooperatives or communities; second, cooperatives or extension agents may invite the best-performing farmers; and third, the most motivated and successful farmers may disproportionately choose to participate in the discussions. The first bias was partially mitigated by asking technical partners to select both strong- and weak-performing groups; the second and third were partially mitigated by moderating the discussion to ensure that all viewpoints were heard. However, due to this limitation, responses in the group interviews were not used to assess the overall effectiveness of any particular project intervention, but rather to help explain associations found in the quantitative analysis and to generate hypotheses to be tested with quantitative data. The qualitative team also faced time constraints, which limited the number and length of interviews. Because of logistical delay for Cameroon and Nigeria, as well as holidays

falling on two business days in Cameroon, the time available in these countries was further limited and several key informant interviews for Cameroon had to be completed by telephone.

Quantitative research was limited by a number of factors. The baseline study for CLP I was designed as a randomized experiment in Côte d'Ivoire and Ghana; villages were supposed to be selected randomly to receive CLP I interventions. However, in the implementation of the project, villages that had been designated as part of the control group that would not receive interventions often received interventions anyway. On the other hand, farmer participation in CLP I interventions was determined by self-reported data from farmers, but there was no way to control for farmers that did not complete the trainings and therefore did not receive the complete intervention package. The data collection for the baseline survey and this survey occurred at different times in the year, which may have affected the accuracy of farmers' recollection. Notably, this survey was conducted in the middle of the main harvest season, which could have confused farmers who may have counted only their partial harvest for the year. This may have a downward bias on 2013 reported yields.

The household survey also collected data on a number of questions where there was the potential for significant measurement error due to inaccurate recall. For example, yields were calculated by asking farmers to self-report the size of their farms and the volume of cocoa they produced. If farmers do not have accurate figures, as was likely the case, or they deliberately exaggerated or understated any of these figures, this likely created biases and reduced the reliability of the data. In addition, in relation to the yield data, because of the large short-term fluctuations in farmers' reported yields, the regression models cannot accurately detect small changes in average yields that are attributable to CLP I interventions rather than random variation in the sample. It is also important to note that the R^2 value — a measure of the percent of variation in yields explained by the independent variables — for every regression model tested for Cameroon, Côte d'Ivoire and Ghana is less than 0.10. This means that whether or not farmers received training, their yields vary widely.

Given these limitations, the analysis of this household survey should be interpreted with caution and considered as preliminary evidence of associations in the data, since the failure of finding statistically significant relationships in this data does not prove that these relationships do not exist. Throughout the findings, this report suggests alternative explanations for associations found.

Organization of the Report

The remainder of this report is organized into three sections: findings, conclusions, and recommendations. Findings from both the qualitative and quantitative research are presented by the eight evaluation questions from the terms of reference for this evaluation. These questions, which were selected WCF's steering committee, examine different aspects of CLP I's performance under its three objectives.

The first, third, and fourth evaluation questions look primarily at CLP I's progress toward reaching its objective of improving cocoa productivity. Evaluation question one examines the overall impact of the program on farmers' cocoa yields, while questions three and four examine respectively the effectiveness of CLP I's trainings and farmers' use of agricultural inputs. Together, the findings to these three questions (1, 3 and 4) discuss how CLP I sought to increase cocoa productivity. The findings to evaluation question two and seven look primarily at CLP I's objective to improve farmers' efficiency marketing their cocoa. Evaluation question two examine the overall impact of CLP I activities on income, with special attention to how increased membership in farmer organizations helped farmers get a fair price for their cocoa, while the findings on evaluation question seven look more closely at how CLP I strengthened farmer organizations. The findings under evaluation question six examine CLP I's progress under its final objective to improve farmers' business practices. It considers the factors that affect cocoa farmers investment decisions and how CLP I activities impact those decisions. Finally, the findings to evaluation questions five and eight look at cross-cutting issues. The findings to evaluation question five look at unexpected results of CLP I, focusing primarily on the

systemic changes that CLP I brought about, and the findings to evaluation question eight look at how CLP I activities impacted women.

Following the findings on each of the evaluation questions, the conclusions synthesize the main lessons learned under each of CLP I's three objectives, and the recommendations provide both short-term and medium-term recommendations, focusing on improvements that WCF can make to its monitoring and evaluation system for the next phase of the project.

Evaluation Findings

Evaluation Question 1: Did CLP farmers record increases in yield of cocoa during the implementation of CLP I? If yes, to what extent can increases in productivity and income of assisted cocoa farmers be attributed to CLP Phase I activities? And if not, why? (e.g., no fertilizer, no credit, no planting material, trees too old etc.)

Evaluation Question 1: Summary Findings on Cocoa Yields

Key Impact

- Farmers reported significant increases in their cocoa yields by adopting practices taught in FFS training. The most common reported improvements were in crop protection practices, including both correct use of products, such as pesticides and fungicides, and improved farm maintenance and aeration.

Other Findings

- The most important constraints cocoa farmers reported to increasing their yields were poor soil quality, access to inputs and the old age of their cocoa trees, which become less productive as they age.
- Data from the household survey showed that there was significant short-term fluctuation in the self-reported yields of farmers, with many farmers reporting large increases or decreases from 2010. Due to this short-term fluctuation, it was impossible to detect long-term trends of impact of FFS among the sample of farmers who received training.

CLP project documents articulate a clear model for how cocoa yields should be affected by the adoption of different good agricultural practices (GAP). According to a summary of the theory of change for the second phase of CLP, which is drawn from research by Mars Inc., WCF states that yields should be increased by an average of 150 kg per hectare through adoption of good agricultural practices and crop protection—including correct pruning, weeding, pest management, harvest and post-harvest methods of fermentation and drying—increased by another 500 kg per hectare by planting hybrid varieties, and increased by another 500 kg per hectare by using fertilizers.

Based on key informant interviews, it appears that industry partners broadly agree with the theory of change, but there are areas of uncertainty. An industry partner in Côte d'Ivoire, for example, reported that they found adoption of good agricultural practices alone without using fertilizers or replanting with high-yielding varieties led on average to a 26.8 percent increase in yield, which is in line with the CLP I theory that farmers can increase their yields by roughly 150 kg/ha by adopting GAPs excluding use of hybrids and fertilizers. However, another industry partner suggested that the effect of adopting GAP may not be linear; saying it instead is dependent on the age of trees and the quality of soil. (In farms where trees are old and soils are exhausted, there is little impact from adoption of good practices.) Conversely, the baseline study conducted for

CLP I showed that Ghana had the highest rates of use for fertilizers and hybrid trees yet the lowest yields, suggesting the use of these inputs alone does not guarantee greater yields.

It appears that substantial research is underway to explore the impact of different agricultural practices on yields, which will help resolve these questions. For example, one industry partner reported starting experiments on 32 sites that compare a control plot against plots with (1) good agricultural practices but no fertilizer, (2) GAP and fertilizer, (3) GAP, fertilizer and grafting and (4) GAP, fertilizer and replanting. Another industry partner reported that they have created a database with information on every farmer they support through their sustainability and corporate social responsibility (CSR) programs. According to the head of their sustainability/CSR department, this data is collected by trainers via mobile phones and includes measures of yields along with their agricultural practices. This is also the case for government partners. In Côte d'Ivoire, ANADER reported that they have conducted baseline yield studies and were planning to conduct follow-up studies at the end of the year.

However, much of this research is not available publically. While some partners are willing to share information on yields, it appears that others consider the information propriety. One partner, for example, explained that there is extreme competition between industry partners, and that to share information, industry partners would likely need a formal agreement to exchange findings. With information not readily available, some uncertainty remains about exactly what increases in yields are attainable. While the goal of reaching 1,000 kg/ha or 1,500 kg/ha appears to be technically attainable, an industry partner interviewed in Ghana and another in Côte d'Ivoire also expressed skepticism about the overall goal of reaching this level of yield in the context of West Africa.

Quantitative and Qualitative Findings

This section examines the quantitative and qualitative evidence gathered from this study to assess whether CLP I's model was successful in increasing cocoa yields. After examining the overall impact of CLP intervention on yields, the evaluation divides the question of yields into two component parts: first, what was the effect of CLP promoted trainings concerning different agricultural practices on yields? Second, what effect did CLP activities have on the adoption of these practices?

Quantitative Evidence of the Impact of CLP I Interventions on Yields

The overall trend of cocoa yields over the life of CLP I project in the four target countries is largely obscured by wide, short-term fluctuations in farmers' self-reported yields. The baseline study for CLP I found that farmers reported cocoa yields in 2010, which ranged from 309.68 kg per hectare on average in Ghana to 408.64 kg per hectare on average in Nigeria. According to data from the 2013 household survey, farmers' average reported yields remained low, between 270–350 kg/ha in all countries except Nigeria, where there was an increase in average yields to roughly 550 kg/ha (see Figure 4). But the reported yields of individual farmers varied significantly in all countries. While the average change in yields from 2010 to 2013 was near zero in all countries except for Nigeria, the standard deviation of change in yields was between 298.52 in Ghana and 668.75 in Nigeria. These high standard deviations—a measure of dispersion from the mean—indicate that the change in yields of individual farmers varied significantly. In Nigeria, where farmers' reported yields increased by 201.81 kg/ha on average, the standard deviation of change in yields was even larger, indicating that there was even more variation in the change in yields among Nigerian farmers.

Figure 4: Cocoa Yields from 2010 to 2013

Cocoa Yield (kg/ha)	Cameroon			Côte d'Ivoire			Ghana			Nigeria		
	2010	2013	Change	2010	2013	Change	2010	2013	Change	2010	2013	Change
Self-reported Yield (kg/ha), Mean	344.44	301.73	-69.42	331.53	324.68	7.82	309.68	276.51	-57.38	408.64	547.64	201.81
Standard Dev	270.29	363.17	486.31	286.15	269.76	349.25	256.74	230.97	298.52	310.05	552.99	668.75

In order to provide a more detailed look at the variation in the change in yields, Figure 5 presents the 5th, 25th, 50th, 75th, and 95th percentiles of the change in reported yields from 2010 to 2013. These figures confirm that the majority of farmers reported large changes in yields from 2010 to 2013. In Côte d'Ivoire, half of all farmers surveyed reported a decrease in yields of more than 140.25 kg/hectare or more than 159.51 kg/hectare. In the other three countries and in Nigeria in particular, these reported changes were greater still. Fully 25 percent of farmers in Nigeria reported an increase of more than 498.67 kg/ha while another 25 percent report a decrease of more than 214.45 kg/ha¹⁴. However, an evaluation conducted by Dalberg Global Development Advisors in 2012 (referred to hereafter as the “Dalberg Report”) found that a small sample of beneficiaries recontacted from the baseline survey increased their yields by 24.55 percent from 2010 to 2012.

Figure 5: Change in Yields from 2010 to 2013 (All Surveyed Farmers), Selected Percentiles

Percentile	5th	25th	50th	75th	95th
Cameroon	-707.64	-263.03	-90.00	27.35	843.63
Côte d'Ivoire	-516.91	-140.25	13.81	159.51	528.33
Ghana	-551.09	-197.87	-31.69	83.48	368.84
Nigeria	-603.49	-214.45	58.98	498.67	1522.15

To test whether there was an association for farmers who received trainings in FFS and/or FBS and also increased their yields, the evaluation team analyzed the household survey data using a linear regression model, which controlled for external factors, and compared farmers who received training to their peers who did not. The results of these models, which are summarized in Figure 3 and included in Annex E, Tables A.8, were inconclusive since findings were not statistically significant between the differences in the yields of farmers who received FFS compared to those who didn't. While the average yields were higher or lower than yields of farmers who didn't receive FFS training, depending on the country and year of training, this variation was not greater than expected due to random selection of the sample, and was not affected by including other covariates in the model. The exception was in Cameroon, where there was a statistically significant association between farmers who received FFS training and a decline in yields.

The association between receiving FBS training and a change in yields was more complex. In Cameroon, like FFS, there was a large negative association between change in yields and receiving FBS training. The effect was similar for farmers who received FBS training in 2010 in Côte d'Ivoire. However, for farmers in Ghana who

¹⁴ It is unclear to what extent this variation represents a real phenomenon of wide short-term fluctuation in yield and heterogeneity among individual farmers and to what extent the variation is due to measurement error from farmers incorrectly reporting their yields. In the analysis of this data, the top 5% of values were trimmed following the procedure used for the baseline study, but the data still show a wide spread of reported change in yields.

received FBS training in 2013 and farmers in Nigeria who received FBS training in 2012, there was a positive, statistically significant association with change in yields. The most positive results for FBS, however, were in Nigeria, where farmers who received FBS training in 2012 reported yields on average roughly 418.09 kg/ha greater than those who did not.

Figure 6: Summary Regression Findings of CLP I Trainings on Change in Yield¹⁵

Dependent Variable = Change in Yield from 2010 to 2013, kg/ha				
Explanatory Variables	Cameroon	Côte d'Ivoire	Ghana	Nigeria
Intercept	299.849	130.088 +	-117.517	125.796
Farmer Reported Exposure				
No FFS	R/C	R/C	R/C	R/C
FFS 2010	-867.076 *	-351.495 +	-12.352	-268.007
FFS 2011	-946.695 *	-144.432	-132.478	-126.885
FFS 2012	-922.208 *	-121.009	-40.086	-466.274 *
FFS 2013 or Currently	-813.795 +	0.857	-146.410	-452.614
No FBS	R/C	R/C	R/C	R/C
FBS 2010	-1109.996 *	-72.818	35.028	65.439
FBS 2011	-1021.023 *	59.840	81.981	-109.010
FBS 2012	-999.982 *	13.546	29.670	418.090 *
FBS 2013 or Currently	-713.742	8.562	199.878 *	242.641
FBS and FFS	1257.253 *	3.252	-87.098	-117.005
Full Package	38.856	99.676	-89.665	86.253
Extension Agent	-190.462	88.312	150.345 *	102.939
Co-op Membership	-42.382	-5.496	-37.474	73.373
Demographics				
Gender: Female	41.887	20.102	-18.399	412.269 *
Age	3.571	-2.348	2.462 +	-3.727
HH Adults	6.836	-10.131	-16.367	33.408
HH Children	-9.946	7.552	7.098	-23.818
Education	24.551 *	-6.154	-0.035	11.959
N	118	402	405	153

¹⁵ This table presents the summary findings of Ordinary Least Squares (OLS) regression models examining the association between receiving CLP I training and change in yields. The values in the table are coefficients, which represent the average effect of the independent variable in the left column on the dependent variable, change in yield from 2010 to 2013. Level of significance for each noted by red asterisks or plus: ***, p-value < 0.001; **, p-value < 0.01; *, p-value < 0.05; + p-value < 0.10. R/C means "Reference Category." For further information and the complete regressions findings and methodology, see Annex E, Tables A.8.

To examine factors that may have influenced the effectiveness of the trainings, the model also tested for additional effects of receiving both FFS and FBS training; receiving these trainings while using pesticides and fertilizers (the “full package”); and the effect of receiving follow-up from an extension agent while receiving training. The associations between these variables and yields varied across countries. In Cameroon, farmers who received both FBS and FFS training did significantly better than farmers who received only one of the trainings. However, these farmers still did worse than farmers that received neither training on average. The only other statistically significant finding in these factors was that farmers in Ghana who reported receiving a follow-up visit from an extension agent did better than those that did not (Figure 6)¹⁶.

The regression model used excludes several CLP I interventions, focusing only on FFS and FBS training. TechnoServe reports that their beneficiaries in Ghana saw an average increase in yields of 225 percent over two years and those in Côte d’Ivoire saw an increase of 65 percent over two years.¹⁷ While there are many unknowns about the selection of the farmers, targeting process may have affected the results of these regression analyses, and could account for some of the negative associations found. Because TechnoServe’s interventions reached a relatively small number of farmers and this survey was designed to follow the sampling plan of the baseline, the evaluation team did not have a large enough sample size of farmers receiving TechnoServe’s intervention to replicate this study.

While the negative association found between FFS and FBS training and yields in some cases is likely due to measurement error, it is possible that farmers who received FBS training may have prioritized increasing their income from other crops or nonagricultural activities. However, this theory was not generally supported by the qualitative research. In the vast majority of group interviews, farmers reported that FBS training helped them to increase their cocoa yields.

Impact of Good Agricultural Practices on Yields

Although the analysis of the household survey data was inconclusive about the effect of CLP I trainings on yields, qualitative research suggests that certain practices could have an important impact. In group interview discussions, farmers frequently reported increases in their yields after CLP I trainings that exceeded the 25 percent that was expected from adoption of good agricultural practices without replanting or applying of fertilizers. In Côte d’Ivoire, of 13 farmers in five cooperatives who volunteered information about their yields, three reported yields increased by 50–100 percent and 10 reported yields increased by more than 100 percent. The yields they reported after training ranged from 300 kg/hectare to 1,000 kg/hectare. Among those farmers, the most commonly cited causes for increased yields were better pruning, weeding and aeration of their cocoa plantations. Farmers also reported better use of pesticides and fungicides—correct dosages at the correct time—though none of the 13 explicitly reported using a greater quantity of these products than before receiving training. None of the 13 farmers reported using fertilizers or replanting with hybrid varieties.

These reported increases are significantly greater than the 25 percent expected increase in yields from adoption of good practices. It could be the case that farmers may have over-reported their yields, been using hybrids or more successful farmers might have been more motivated to volunteer information, however this was not mentioned in the interviews. In Ghana, in particular, yield increases could be partly attributed to use of hybrids where Government officials reported that the majority of cocoa tree stock are now hybrid, making it difficult to discriminate between the impact of GAP, hybrids and fertilizer.

¹⁶ These findings should be interpreted with caution. Because of the large short-term fluctuations in farmers’ reported yields, these regression models cannot accurately detect small changes in average yields that are attributable to CLP I interventions rather than random variation in the sample.

¹⁷ TechnoServe Semi-Annual Report for CLP I Project, August, 2013

However, there is also evidence that good practices can, in some cases, have a substantial impact on yields without use of hybrid varieties or fertilizers. A common theme raised by cocoa experts interviewed was that proper aeration of cocoa fields could reduce infestations of pests and fungi, including black pod, and lead to major increases in yields. This factor was cited as a top contributor to improving yields by the national coordinator of ANADER in Côte d'Ivoire. In Cameroon, this appeared to be particularly important, because many farmers reported losing significant portions of their crops to black pod. In Ghana, many interviewed farmers reported that they had previously left diseased pods on the trees but had learned the importance of removing them due to FFS training. The practices most closely associated with improved aeration were pruning, weeding and properly disposing of diseased pods. Beyond the effect of improving aeration, farmers also suggested that pruning could improve the overall health of the trees. One farmer in Côte d'Ivoire explained that when cocoa trees exceed 4 meters in height, they become weak and have lower yields.

In group interviews, several farmers cited dramatic increases in production from improving the aeration of their fields and protecting their crops. In some cases, the gains were large because farmers had lost major portions of their production from infestations in the past. One FFS trainer in Cameroon explained that if it isn't managed, a black pod outbreak can destroy up to 90 percent of a farmer's production for the year. The evaluation team recorded several examples of this during group interviews. In Cameroon, one farmer reported that he had produced only 320 kg on his 3 hectare plantation because his farm was "in total disorder before"; another reported an increase from 192 kg to 1,088 kg by maintaining his farm better. In Cameroon in particular, a common theme in farmer group discussions was that by adopting better practices to aerate and protect crops, they were able to both decrease losses and use less total crop protection products.

An associated practice was use of pesticides and fungicides to protect crops. While farmers in group interviews did not often report that they were using more of a product than they had before, they frequently reported using the products more effectively—at the correct time in the correct dosage—and avoiding counterfeit products. In Côte d'Ivoire, a TechnoServe representative said that by delivering crop protection products in a coordinated way through the cooperatives, they were also helping to avoid infestations from spreading from one farm to another. Usage of agricultural inputs is discussed further under evaluation question four.

The other major area of improvement that did not require fertilizers or hybrid varieties was in post-harvest handling. In group interviews, farmers frequently said they had increased the amount of time they allowed their cocoa to ferment and dry. This increased the quality and weight of their beans, meaning less of their cocoa was rejected and they ultimately sold greater quantities. A notable exception was in southwest Cameroon, where farmers reported that there was so much rainfall, it was impossible to correctly dry cocoa.

The findings that these practices may positively impact yields were not directly corroborated by the analysis of the household survey data. The association between yields and use of good farm maintenance practices (pruning, weeding, removing diseased pods, removing mistletoe and removing chupons) was not statistically significant in most cases. In Nigeria, there was a negative association between pruning and change in yields. Similarly, the association between use of pesticides/herbicides and yields was not strong. The only statistically significant association was found in Ghana, where use of pesticides had a positive association with yields. Finally, no statistically significant relationship was found between reported use of better post-harvest practices (the only one included in the survey was use of a drying mat) in any of the countries. For further details on these regression models, see Annex E, Tables A2A7.

Constraints for Yields

In discussions with cocoa experts and cocoa farmers, the most common explanations for low yields were poor soil quality, use of fertilizer, aging cocoa trees and weather conditions. Although, the exact constraints varied among the four countries, and even among regions within countries.

In Côte d'Ivoire, soil quality was a major concern. One farmer in Côte d'Ivoire recalled that when there were virgin forests, it was possible to clear a new field and plant cocoa, but added that now there is no new land and soil quality has been degraded. A technical partner confirmed this, saying that historically, farmers in Côte d'Ivoire wanted to have large plantations, so they rapidly planted new areas and put less emphasis on maintaining soil quality by planting sufficient shade trees, composting or using chemical fertilizers. Another technical partner in Côte d'Ivoire suggested that many farmers may still take this approach: FFS training recommends planting plantain trees one year before planting new cocoa to provide shade, but he said that many farmers do not follow this advice.

In Côte d'Ivoire and Ghana, cocoa experts and farmers were nearly unanimous in the view that fertilizers could greatly improve yields by relaxing this constraint. In Cameroon, farmers in most group interviews reiterated that fertilizers are necessary due to low soil quality, but in one discussion, a farmer said some believe that fertilizers are unnecessary and could actually damage the soil. In visits to cocoa plantations in Cameroon, the evaluation team observed that cocoa in these countries was planted with significantly more shade trees, suggesting that soil quality could be less of a constraint. Most farmers interviewed in Nigeria did not believe that fertilizers were necessary or that they increased yields. However, the findings under evaluation question 4 also show that farmers report using fertilizers in Nigeria at a level equivalent to Ghana, suggesting that this belief may not be as common as the qualitative research suggests.

Unlike the other countries visited, farmers in Ghana reported using fertilizers on a significant scale. In addition to the practices cited in other countries — pruning, weeding, correct use of pesticides — farmers in Ghana typically reported that use of fertilizers was the main factor contributing to higher yields. During one group interview discussion, five farmers gave examples of their yields doubling or even tripling. One farmer was producing five bags before GAP training, which increased to 20 bags, on 2 acres of land; another farmer increased production from 16 bags on 3 acres to 45 bags.

Quantitative evidence from this study was consistent with these findings. In Ghana and Côte d'Ivoire, there was a positive association between use of chemical fertilizers and a change in yields. By contrast, this association was not statistically significant in Cameroon or Nigeria. Given the limitations of the 2013 survey data, this should be treated as a preliminary finding, but it does appear to corroborate the suggestion in key informant interviews that soil quality is a larger constraint in Côte d'Ivoire and Ghana than in Nigeria and Cameroon. It is notable that other major studies on the impact of fertilizers, such as an IDH study,¹⁸ also focus on Côte d'Ivoire and Ghana for their trials, while there is less data available showing that fertilizers have a major impact in Cameroon and Nigeria. However, it is important to recognize that the farmers interviewed in Nigeria and Cameroon who were opposed to using fertilizers were not a representative sample and could have been in areas with the most fertile soils.

Aging cocoa tree stock also appeared to contribute to low yields in most countries. Most technical experts consulted said that yields from cocoa trees start declining once the plant reaches approximately 30 years in age. In each country, the government operated a research institute that distributed pods and seedlings of improved varieties of cocoa that can have higher yields, but many farmers reported being unable to get sufficient access to these improved planting materials. Because new cocoa trees take three to five years to begin producing fruit, the 2013 household survey does not provide evidence on the effect of replanting cocoa trees on yields. However, in the findings related to evaluation question 4, this report examines whether or not farmers replanted as a result of CLP I trainings, and the supply constraints farmers faced in acquiring improved planting materials.

¹⁸ Francois Ruf, *Cocoa and Fertilizers in West Africa*. (IDH: 2011).

Weather was also a concern in most countries. In southwest Cameroon, farmers reported that rainfall had been so heavy in 2013 that they couldn't contain black pod outbreaks, that the cycle of their harvest had become unpredictable, and that they were having trouble drying their cocoa. By contrast, in Côte d'Ivoire, farmers said that the rainy season had come too late this year, which had a significant impact on yields. While these problems may be explained by the normal fluctuations in weather conditions, several farmers said they believed that weather had become more unpredictable in recent years due to climate change.

Evaluation Question 2: Have farmer income levels changed since CLP Phase I? If yes, what are the critical factors (in order of importance) that have impacted the income levels of assisted farmers? How has this new income been used (e.g., sending kids to school, cocoa farm investments, food, etc.)?

Evaluation Question 2: Summary Findings on Farmer Incomes

Key Impacts:

- Cocoa farmers, particularly in Cameroon and Nigeria, reported that by using pesticides and fungicides correctly they were able to reduce the total quantities used and save money, increasing their net income.
- Cocoa farmers in all countries reported that by improving the quality of their cocoa they reduced rejection rates and often received certification premiums, which increased income.
- Cocoa farmers who were members of a farmer organization reported receiving a fairer price for their cocoa by selling cocoa directly to exporters. Farmers most often reported that itinerate traders offered the same nominal price as exporters but used tactics such as “rejecting” a portion of the cocoa but taking it anyway to effectively decrease the price.

Other findings:

- Data from the household survey showed that farmers' income from cocoa declined on average in all countries since 2010, which appears to be primarily due to a decline in the world price of cocoa.
- In Ghana and Côte d'Ivoire, which have price controls, producer prices declined less than in Nigeria and Cameroon, but the producer prices were still higher in Nigeria and Cameroon than in Ghana and Nigeria.

CLP I interventions sought to increase total household income both from cocoa sales and sales of other crops. This section first looks at the overall change in income from all sources, and then focuses on changes in income from cocoa production. Income from other crops and nonagricultural activities is discussed under evaluation question six, where the evaluation discusses the effect of CLP I activities on farmer decisions to diversify.

According to data from the 2013 household survey, the total income of cocoa farming households has declined in all countries except Nigeria (see Figure 7). According to the baseline report, average household income in 2010 ranged from \$1,802 USD in Côte d'Ivoire to \$3,779 USD in Cameroon. The data from the 2013 household survey showed that incomes decreased in all countries, and decreased most significantly in Cameroon. Decreased incomes were driven by a decline in cocoa income, while the only consistent increases came from nonagricultural income. This was an unexpected result, since according to the original theory of change for phase I of CLP, the largest increase in income should have come from additional sales of cocoa.

To more closely assess the change in cocoa income, we consider three factors that affect income from cocoa sales: (1) change in volume and quality of cocoa sold; (2) change in cocoa prices; and (3) change in the cost of inputs, which impacts the effective income from cocoa.

The first effect is discussed under the findings for evaluation question 1. While farmers in group interviews reported significant increases in income in all countries due to increased yields and corresponding increases in their incomes, the evaluation team’s analysis of the data from the 2013 household survey produced inconclusive results on the overall effect of CLP trainings on yields. The possible explanations for these discrepancies are discussed in greater detail in the findings for evaluation question one; however, since there is not a conclusive impact of CLP I training on yields, we cannot conclusively show that CLP I interventions increased incomes by increasing cocoa yields.

Figure 7: Average Change in Income from 2010 to 2013 by Country

	Cameroon	Côte d’Ivoire	Ghana	Nigeria
Cocoa Income (Change)	-2,193.65	-1,002.10	-1,052.71	-1,632.67
Other Agricultural Income (Change)	-742.12	-154.74	-275.71	262.26
Nonagricultural Income (Change)	56.03	109.32	18.55	582.46
Total Income (Change)	-2,959.89	-1,135.93	-1,330.61	-927.78

According to the CLP I theory of change, program interventions were also intended to increase producer prices by 10-15 percent by improving farmers’ bargaining position. Attainment of this goal varied greatly from country to country, in part, because of their different price regimes. Over the life of the project, the world price of cocoa dropped from \$3525.12/ton to \$2824.54/ton,¹⁹ but the impact of producer prices varied. In Ghana, producer prices for cocoa were set and controlled by the government from the beginning of the project. In Côte d’Ivoire, the government set a minimum producer price for cocoa partway through the project. By contrast, in Nigeria and Cameroon, there have been no price controls.

Changes in the prices received by producers from 2010 to 2013 are summarized in Figure 8. According to the baseline survey, average producer prices were lowest in Côte d’Ivoire and Ghana and highest in Cameroon and Nigeria. With the decline in world prices, producer prices also fell in all countries. In Ghana and Côte d’Ivoire, where price controls were in place, producer prices fell absolutely, but did not fall as a percent of world prices. Farmers in Nigeria and Cameroon experienced a larger fall in producer prices, but still received a higher price and higher portion of world prices than farmers in Ghana and Côte d’Ivoire. This fall in cocoa prices represents the most likely cause for the decline in cocoa income noted above in all countries.

Increased membership in farmer organizations was intended to improve cocoa farmers’ negotiating position. However, in Côte d’Ivoire, where cooperatives are strongest, the government’s introduction of a minimum price for cocoa in 2012 may have put members of cooperatives on the same footing as unorganized farmers. In Cameroon, there was evidence that unorganized farmers continued to get low prices because of their weak negotiating position. Farmers in two cooperatives reported receiving bad terms when selling to itinerant buyers, either through low prices or by traders paying them for only a portion of their cocoa. In one group interview, farmers further alleged that traders use scales that have been calibrated to underestimate the weight of their cocoa. Despite these problems with selling to itinerant buyers, membership in cooperatives remains

¹⁹ International Cocoa Organization (ICCO), Monthly Averages of Daily Prices: <http://www.icco.org/statistics/cocoa-prices/monthly-averages.html>

quite low, and even members of cooperatives admitted to selling much of their cocoa to traders rather than the cooperative.

Figure 8: Reported Producer Price of Cocoa in 2010 and 2013 (Reported by Farmers)

	Cameroon			Côte d'Ivoire			Ghana			Nigeria		
	Mean	Std Dev.	% World Price	Mean	Std Dev.	% World Price	Mean	Std Dev.	% World Price	Mean	Std Dev.	% World Price
2013 Cocoa Prices (USD/kg)	1.85	0.17	65%	1.49	0.16	53%	1.49	0.09	53%	1.94	0.37	69%
2010 Cocoa Prices (USD/kg)	2.26	0.17	64%	1.72	0.30	49%	1.80	0.25	51%	2.57	0.43	73%

It is notable that these qualitative findings appear to be at odds with the survey data showing that farmers in Cameroon received higher prices on average than their peers in Côte d'Ivoire and Ghana. Farmers may be overstating their losses from selling to itinerant buyers, but it is also possible that they are receiving a nominally high price but getting an effectively lower price because of the practices they noted in which traders either reject large portions of their cocoa or use deceptive methods such as falsifying their scales. The evidence on the effect of cooperative membership of prices received was strongest in Nigeria, where farmers consistently reported that their cooperative's links with exporters allowed farmers to receive better prices.

Though the evidence is mixed on whether membership in farmer organizations improved farmers' negotiating position, there is stronger evidence that membership in farmer organizations helped farmers to benefit from a certification bonus. In Côte d'Ivoire and Nigeria, every cooperative that received support from CLP I also became certified or was on track to become certified, which created additional income. While these programs varied, a typical arrangement, as described by the board of directors of one cooperative in Côte d'Ivoire, was that there was a bonus of roughly \$.20 per kg of certified cocoa, of which 50 percent went to the farmer, 20 percent went to the board of directors, and 30 percent went to the exporter that pre-financed the costs associated with certification. According to SOCODEVI's records, this represented significant income for farmers. The cooperative that generated the most income from this source, CAT, reportedly distributed 110,340,000 FCFA (\$228,532 USD) to its members in the 2011–2012 season for an average of \$228 USD per member. However, many farmer organizations are pursuing certification outside of the CLP I program, so it is not possible to attribute this entirely to CLP I interventions. Certification is discussed further under the findings for evaluation question 7 on the impact of project activities for farmer organizations.

Another source of additional income for cocoa farmers came from improving the quality of their cocoa. In all four countries, farmers often mentioned that learning proper harvesting and fermenting techniques increased the quality of their cocoa. In addition to increasing the weight of their cocoa beans, thus increasing yields, farmers reported that improving cocoa quality also helped them reduce rejection rates by exporters. In Nigeria, farmers also reported receiving higher prices due to higher-quality beans, but in Ghana and Côte d'Ivoire where there were greater price controls, improved quality did not always guarantee an increase in price. In Cameroon, one industry partner said that, because farmers do not properly dry their cocoa, they are receiving a lower price for their cocoa than the prevailing market price. Farmers in two cooperatives interviewed in Cameroon reported that, in practice, farmers didn't receive a lower price, but that itinerant buyers pay them for only a portion of their cocoa when it hasn't been properly dried. Several farmers also reported that they are forced to use ovens to dry their cocoa, which imparts a smoky flavor. However, a common complaint from farmers in Cameroon was that when they did make investments in improving the quality of their cocoa, they still weren't receiving a higher price.

There is evidence that CLP I interventions helped reduce this lost income. SOCODEVI provided cooperatives with training to improve the quality of their cocoa and equipment to ensure that it had been sufficiently dried, and helped link cooperatives in Nigeria to exporters that provided certification training to the cooperatives. It appears that this had a significant impact on improving the quality of cocoa sold through the targeted cooperatives. The board of directors of two cooperatives in Côte d'Ivoire reported that with SOCODEVI's training, they had reduced their rejection rate to nearly zero. The evaluation team confirmed by visual inspection that these cooperatives had trained staff who could analyze the quality of the cocoa and dry cocoa further to meet standards. FFS/GAP training also included modules on proper drying and fermentation of cocoa. The impact of this training is discussed further under the findings of evaluation question 3 on adoption of good agricultural practices.

Aside from the quantity of cocoa sold and the producer price of cocoa, farmers reported increasing their effective cocoa income as a result of CLP I interventions by reducing expenditures on pesticides, fungicides and herbicides. Farmers often reported that they were able to reduce their need for these products because of better aeration of their cocoa plantations, more effective use of crop protection products and better management of their plantations. Farmers in Cameroon and Nigeria were especially likely to mention this as a contributor to additional income. In Cameroon, farmers in all seven cooperatives visited by the evaluation team reported significant savings by reducing use of fungicides. Because of the prevalence of black pod in Cameroon, farmers reported that with better aeration and proper disposal of diseased pods, they could drastically decrease the need for fungicides. In Nigeria, a decrease in pesticide use was contributing to saved income as farmers learned that they were over applying the products. In Côte d'Ivoire, only one farmer explicitly mentioned cost savings from decreased use of inputs, but one zonal director of ANADER also cited this as an important source of cost savings for farmers.

A related factor was improvements in the terms of loans received for agricultural inputs. In Cameroon, farmers in two group interviews reported that they had taken loans with a 100 percent interest rate to buy inputs such as fungicides. According to farmers in one group interview, this is a typical system in which a cocoa trader will provide inputs up front with the requirement that the farmer sell to him, and then deduct twice the cost of the inputs from the sale. In Ghana, many farmers reported that they did not have access to credit, but others felt that the interest rates for loans were too high — they reported receiving 1.5 percent per month at Opportunity International Savings and Loan (OISL) and 3 percent at banks — and the repayment period of four months was too short and came due at the same time school fees were due. In group interviews, farmers in Côte d'Ivoire did not specifically mention borrowing at these high interest rates, but farmers in one cooperative mentioned that they had been highly indebted and were using additional income they had earned by increasing cocoa sales to pay off their debts.

The final program component related to increasing income was economic diversification. As noted above, data from the 2013 household survey suggest that this was the main driver of increased income among cocoa-producing families. In all countries, there were gains in income from nonagricultural economic activities, and in Nigeria, farmers also reported that they significantly increased their other agricultural income as well. These findings are discussed in greater detail under the findings for evaluation question 6 regarding diversification.

Among farmers who reported increasing their income as a result of CLP I interventions in group interviews, the most common expenditures derived from additional income were building or renovating houses, paying school fees for their children, and buying motorbikes, as well as increased savings. Other key informants generally corroborated these self-reported uses of income, but a technical partner in Côte d'Ivoire argued that few farmers save or reinvest new income; two other technical partners suggested that farmers may be using part of new income for purposes they considered less productive, such as marriages and funerals or purchase of alcohol. A government partner in Cameroon reiterated this theme, suggesting that many farmers spend

excess income on alcohol. Most farmers interviewed said they had learned the importance of saving, but few had any quantifiable evidence beyond naming things they had purchased.

Evaluation Question 3: To what extent have different approaches in training farmers improved adoption rates and productivity of farms in targeted communities? Which approaches are more effective? What are the constraints and interventions to address them?

Evaluation Question 3: Summary Findings Farmer Training

Key Impacts:

- Farmers interviewed by the evaluation team had a positive view of FFS and FBS training and uniformly reported adopting new farming practices as a result of trainings that increased their cocoa production.
- The most common practices farmers reported adopting were improved pruning, weeding, use of crop protection products, and drying and fermenting cocoa for the correct length of time.

Other Findings:

- FFS was most effective where it successfully provided hands-on training and gave trainees a chance to see the impact of adopting the recommended practices.
- Data from the household survey showed that a large majority of farmers report adopting most of the recommended farm maintenance practices (pruning, weeding, etc.). However, qualitative research suggested that the major impact of the trainings would be in the quality of application of these practices.

The major trainings during CLP I were farmer field school (FFS) training in good agricultural practices (GAP) and farmer business school (FBS) training in farm management. The impacts of the practices promoted by the trainings on cocoa yields and income are discussed under the findings for evaluation questions 1 and 2. In this section, we discuss the extent to which adoption of good practices in these areas can be attributed to the trainings and the relative effectiveness of the different models for delivering the trainings. While this section looks only at the impact of training on adoption of good practices, many of the good practices involve investments of time or money. Other factors may affect these investment decisions, and are considered under the findings for evaluation question six, which discusses farmers' investment decisions.

In group interviews in all countries, farmers were extremely positive about their experiences with FFS/GAP and FBS training and reported adopting new practices as a result of training. The practices farmers most frequently reported adopting due to FFS/GAP were (1) pruning their cocoa trees, (2) weeding their plantations, (3) using the correct quantities of crop protection products at the correct times and (4) drying and fermenting cocoa beans for the proper length of time. Use of inputs is examined in greater detail under evaluation question 4; the other three practices are considered separately below. Figure 9 shows the proportion of farmers in the 2013 household survey who report using these practices.

Figure 9: Self-Reported Application of Good Agricultural Practices (2013 Household Survey)

Good Practices	Cameroon	Côte d'Ivoire	Ghana	Nigeria
Farming Practices				
Prune	75%	81%	89%	86%
Pods	95%	96%	98%	96%
Weed	98%	99%	100%	98%
Chupons removal	92%	99%	97%	82%
Mistletoe removal	62%	97%	95%	81%
Harvest Practices				
Drying Mat	93%	91%	98%	70%
Correct Replanting of Cocoa Fields				
New Cocoa Trees Planted	76%	42%	68%	84%
Purchased seeds/pods/seedlings in past 12 mo.	21%	7%	46%	35%
More than 50% trees planted in rows	44%	19%	29%	66%
Higher cocoa tree density (line & pegging)	35%	22%	27%	47%

Pruning

Pruning was the practice farmers most often reported adopting as a result of FFS/GAP training in group interviews. However, according to the baseline study, the majority of farmers reported pruning before receiving FFS/GAP training. In the baseline study, 60 percent to 82 percent of farmers reported pruning trees that were 4 years old or younger, with the low in Cameroon and the high in Nigeria. The Dalberg report showed increases in these rates. In Ghana, for example, 96 percent of farmers who received FFS/GAP training reported pruning in 2012, up from 77 percent in the baseline. However, 80 percent of those farmers reported that they started pruning after receiving FFS/GAP training. The same was true of the Dalberg data in Côte d'Ivoire and Nigeria — nearly all farmers reported pruning, and many seem to have overstated the impact of CLP I on their adoption of this practice. This finding appears to be at odds with the baseline study finding that most farmers were already pruning before training; however, it is possible that after learning they were pruning incorrectly before the training, farmers may have considered this a new practice.

The 2013 household survey found that large majorities of farmers reported pruning trees and removing chupons and mistletoe (see Figure 6). The only notably lower application rates were in the removal of mistletoe in Cameroon and Nigeria. Because such a large majority of farmers reported pruning in all countries, it is difficult to detect an association between CLP trainings and the use of these practices. However, a regression analysis found that in Nigeria, there was a statistically significant relationship between receiving FFS and FBS training and pruning, but no statistically significant relationships were found in the other countries. These regression results are in Annex E, Table C2.

A notable finding of the Dalberg report was that in farm visits, pruning was applied less often and less effectively than farmers reported. In Ghana, the Dalberg report found that in six of 15 farms visited, farmers were not pruning; in Côte d'Ivoire, they found that farmers were properly pruning in only five of 20 farms visited, while another 11 were pruning but had not “mastered the practice.” This was in line with the evidence found in key informant interviews for this evaluation that pruning is particularly difficult to teach and

psychologically difficult to adopt. In Côte d'Ivoire, a manager at ANADER and a technical partner explained that farmers resist adopting this practice because it seems counterintuitive that removing branches could increase the final yield. An FFS trainer in Côte d'Ivoire further argued that many farmers are simply conservative; saying that if they have inherited the farm from their father, they feel it is a betrayal to use different practices. In Ghana, a technical partner suggested that farmers know how to prune, but they don't like to do it because they get emotionally attached to the trees. These findings suggest that the quantitative data may not be sufficiently sensitive to improvements in the quality of pruning, and that the improvements from CLP I training may be primarily in the quality of pruning rather than increasing the quantity of farmers who prune at all. While it was difficult to assess the quality of pruning from group interviews, informal site visits conducted during the evaluation provided preliminary evidence that farmers improved their pruning practices after FFS training.

Weeding

Weeding was the next most common practice farmers reported adopting as a result of training. A review of the quantitative findings reveals a trend similar to the data on pruning: 82–99 percent of farmers reported weeding their plantation in the last 12 months in the baseline study. The adoption rates were practically the same in the Dalberg study, ranging from 88 percent in Nigeria to 99 percent in Ghana. Farmers in that study have also overestimated the effect of FFS/GAP training on adoption of this practice. Even though there was only an 8 percent increase in the reported adoption of weeding in Ghana (from 92 percent to 99 percent), 66 percent of farmers reported adopting timely weeding as a result of FFS/GAP training. The 2013 household survey found that a similarly overwhelming majority of farmers reported weeding in a timely fashion. Because of the high reported application of weeding, it was not possible to detect an effect of CLP I interventions on this practice. Similar to the data on pruning, farm inspections for the Dalberg report found that less than half of farmers in Nigeria and Côte d'Ivoire were correctly weeding in the farms visited for inspections. However, auditors for all 15 farms visited in Ghana reported the farmers were weeding correctly. As with pruning, these findings suggest that the quantitative data collected may not have been sufficiently sensitive to improvements in the quality of weeding and to factors such as the frequency of weeding, which could be a more significant impact of FFS training.

Correct Harvest and Post-Harvest Techniques

Correct harvest techniques were another commonly cited improvement in group interviews. Farmers reported collecting pods more frequently during the harvest, and fermenting and drying their cocoa for longer due to FFS training. The 2013 household survey did not directly gather information on this practice; the only question that related to harvest and post-harvest techniques was whether farmers use a drying mat. Large majorities of farmers in all countries except for Nigeria reported applying this practice. While it is not clear why the rate of application was lower in Nigeria, it was the only country where regression modeling found a positive association between receiving FFS training and applying this practice. This provides preliminary evidence that in Nigeria, FFS training may have helped to improve harvest practices.

Impact of FBS Trainings

Because FBS training included more crosscutting topics that could affect a number of farm management practices, it was difficult to isolate the impacts of this training. When prompted in the group interviews to describe practices they adopted due to FBS training, the most common responses were recording their expenses and revenue, planning their planting seasons better, using correct quantities of inputs and saving. For example, in one women-only group interview in Côte d'Ivoire, every member reported having a savings account, which they said made it easier to save, get access to credit and track their expenses.

In a group interview in Cameroon and Ghana, farmers reported that they now think of farming as a business, know the costs of inputs and plan using a farm calendar. In Ghana, farmers often cited “money in, money

out” as a lesson they had learned on the importance of recording expenses and income. Farmers in Nigeria, particularly women, mentioned learning how to keep records of their expenses and sales of cocoa as well as other crops. Illiterate farmers frequently reported that their children helped them with their accounts. In addition, FBS in Nigeria was in high demand. Trainers explained that when they visited communities, more than 30 farmers would want to participate; this often included non-cocoa farmers who wanted to learn the business aspects that FBS taught. A GIZ study of the impact of FBS suggested that farmers who received FBS but not FFS training also reported adopting good agricultural practices at rates close to those of farmers who received FFS training as well. This study did not compare these findings to farmers who received neither FFS nor FBS, but it does suggest that FBS training may prompt farmers to adopt better practices. The analysis of the quantitative data from the 2013 household survey did not produce conclusive results about the impact of FBS training on adoption of good practices. In all countries except Nigeria, there were no statistically significant associations found between receiving FBS and using the good practices discussed above. In Nigeria, the strongest positive relationship was found between receiving FBS in 2010 or 2011 and reporting application of pruning. The relationship was not statistically significant for farmers who received FBS training in 2012 or 2013.

Effectiveness of Models of Delivery for FFS and FBS Training

There was significant variation in the delivery of the FFS and FBS trainings across countries and over time. Farmers, trainers and other key informants cited a number of variations that affected the quality of the training, including: (1) length of the FFS training cycle; (2) follow-up that farmers receive and resources available to trainers; and (3) integration of FFS and FBS trainings.

Length of FFS Training

Several of these variations were related to the shift in management of FFS training in 2012. Before 2012, all FFS training was delivered by the International Institute for Tropical Research (IITA) on a nine-month cycle. After 2012, responsibility for FFS training was transferred to government extension agencies in all countries except Cameroon, where training was managed directly by SOCODEVI with only minimal involvement by the Ministry of Agriculture and the Coffee and Cocoa Board. In the course of this shift of responsibility, the training cycle was reduced to six months so that two cycles could be completed in a year. The exception was in Ghana, where COCOBOD extension agents were still training on the nine-month cycle and they remain in the same communities for three years. This enables them to continue to follow up with groups and help them organize into farmer organizations. However, the evaluation team heard reports that COCOBOD is going to reduce the training to six months and reduce the extension agents’ time in each community to a year and a half.

Some of the qualitative research suggested that these changes to the FFS training system could have had an impact on the outcomes for farmers. In Côte d’Ivoire, one technical partner explained that before the change of responsibility, training for FFS trainers was managed by IITA’s master trainers, but when ANADER took over FFS training, this responsibility was shifted to ANADER’s technical specialists. He argued that under the former structure, FFS had been an integrated system of adult learning that emphasized behavior change, but with the shift in responsibility, FFS had moved to a more basic methodology of transferring knowledge. However, during visits to FFS training sites, the evaluation team observed that training sessions were still based on an interactive method in which farmers have an opportunity to do hands-on work during the training and see the comparison with the control plot.

In group interviews, some farmers in Cameroon, Nigeria, and Côte d’Ivoire reported that the quality of FFS/GAP training declined because of the shorter training cycle. Trainers in Cameroon were the most vocal about the problems associated with the shorter training cycle. Every group of trainers interviewed reported that because of the shorter cycle, farmers were unable to see the impact of adopting good practices. For one

cycle, they said farmers don't get hands on experience with harvest practices and don't see the final difference in yield; for the other, they said it was impossible to teach pruning because there are already pods on the trees. This view was also expressed by trainers in Côte d'Ivoire. In Nigeria, trainers had differing views; one reported that changing the FFS from nine months to six months made the training too rushed, hindering the ability to follow up with the communities. However, another felt that nine months was too long and the switch to six months allowed them to reach more farmers. While many farmers also reiterated the view of the negative impact of shorter training cycles, it was not unanimous. In one group interview in Cameroon, farmers who received both the six- and nine-month trainings reported that the content had not changed.

Follow-up to Training and Trainers' Resources

The ability of trainers to follow up with trainees varied significantly among the four countries. In Ghana, trainers remained in the same communities for three years and reported having ample opportunities to visit farmers on their fields and guide their practices. In Côte d'Ivoire, ANADER managers said they set a goal of visiting at least 70 percent of farmers on their fields. While they reported that they met this goal, some trainers said they were limited by the large number of farmers they were responsible for. In addition, the poor condition of the roads and their motorbikes made follow-up difficult. A trainer typically reported having responsibility for five to six groups of 20–30 students. These problems appeared to be worse in Cameroon and Nigeria, where trainers reported that after the shift in responsibility from IITA, they no longer received motorbikes or any funding for transportation. While some said they had their own motorbikes, others said they didn't have any means of getting to the different communities and the farmers' fields. While no trainers gave exact numbers, they suggested that they were able to meet with only a fraction of students on their fields. Supervisors also didn't have motorbikes or vehicles, which limited their mobility to access the trainers and the communities.

Some of the examples cited by farmers and trainers suggested that follow-up helped change behavior. For example, one trainer in Côte d'Ivoire reportedly visited a plantation and corrected a farmer's incorrect pruning methods, and then discussed the example with the group in a subsequent session. In the analysis of the 2013 household survey data, the evaluation team looked for associations between receiving a visit from an extension agent and adoption of good practices or increases in yields. While it was difficult to detect these associations for the reasons described in the findings under evaluation question 1, we did find a statistically significant, positive association between receiving a visit from an extension agent and increasing yields in Côte d'Ivoire.

Integration of FFS and FBS Training

FBS training was integrated most fully in Ghana, where extension agents incorporated FBS training alongside the GAP training in their annual training cycle. In Côte d'Ivoire, ANADER managers explained that more senior technical specialists deliver FBS training, while the extension agents who deliver FFS are only asked to follow up on the training. By contrast, in Cameroon and Nigeria, it appeared that the two trainings were less integrated. In some states in Nigeria, GIZ and TCU/ADP appeared to be working together to make sure that the FFS groups got FBS training, but in others this apparently wasn't happening. Part of this was because FFS/GAP training takes six months, whereas FBS takes only one week, meaning FBS can be implemented faster. In some cases, there were examples of extensive overlap of trainings; for example, one cooperative interviewed in Nigeria had received FFS and FBS training, as well as training for certification, SOCODEVT's group dynamics training, export commercial council training, lead farmer training, and then at the time of the interview, they were receiving FFS training a second time from the government.

Evaluation Question 4: How has CLP Phase I impacted farmers’ access to improved planting material, cocoa finance, cocoa inputs (fertilizers, agrochemicals)? What innovations (e.g. business service centers) are most efficient with getting services down to the farm level?

Evaluation Question 4: Summary Findings on Farmers’ Access to Planting Materials, Finance and Inputs

Key Impacts:

- Input suppliers are increasingly offering packages to farmer organizations to sell crop protection products such as pesticides and fungicides on credit. It appears that Technoserve’s credit scheme may have stimulated the market for these input packages.
- A large majority of farmers interviewed in the household survey report using crop protection products.

Other Findings

- CLP I activities have increased demand for improved cocoa varieties and community nurseries set up by CLP I have improved distribution of these improved planting materials, but government distribution centers cannot meet demand.
- Fertilizer use remains low in all countries—less than 50 percent of farmers surveyed report using any fertilizer in the last 12 months. However, use is greater in Ghana and Nigeria, around 35 percent, where government programs promote fertilizer use.

In this section, we consider the extent to which farmers use agricultural inputs, the factors that constrain access to these inputs and the effect of CLP I interventions on farmers’ use of inputs. For the purposes of this evaluation, we consider three categories of inputs separately: (1) crop protection products including pesticides, fungicides and herbicides; (2) improved planting materials; and (3) fertilizers.

Crop Protection Products

In the baseline survey, a large majority of farmers reported using pesticides at least once in the last 12 months in Ghana, Cameroon, and Nigeria (77 percent–89 percent) and a bare majority in Côte d’Ivoire (54 percent). Midline data showed increases in Ghana, Côte d’Ivoire, and Cameroon: Ghana was up from 77 percent to 95 percent, and Côte d’Ivoire was up from 54 percent to 97 percent. In Nigeria, the rate remained the same. Rates of application of pesticides reported in the 2013 household survey were consistent with these findings.

One notable finding was that use in Côte d’Ivoire was down to 73 percent. Similar to the findings under evaluation question 3, the findings of the Dalberg study suggest that farmers may have overestimated the impact of CLP I interventions on their use of pesticides. For example, in Nigeria, where the rate was practically the same, 41 percent of farmers reported that they started using pesticides after CLP training. Using a regression analysis of the 2013 household survey data, no statistically significant association was found between receiving FFS/GAP and FBS trainings and applying pesticides.²⁰ While use of fungicides was not captured in the baseline survey or the 2013 household survey, the Dalberg survey revealed a similar trend to that of pesticide use — farmers reported near universal use in Ghana and Nigeria (91 percent and 92 percent), while a smaller majority reported use in Côte d’Ivoire (76 percent).

²⁰ Complete results of these regression models can be found in Annex E, Table D.5

These findings suggest that access to crop protection products is not a major constraint for most beneficiaries of CLP I's interventions and that increased use of these products was not a major outcome of CLP I, except possibly in Côte d'Ivoire. There was some evidence in Côte d'Ivoire that increased use of crop protection products was in part due to an increasing trend for input suppliers and exporters to make bulk deals with cooperatives to sell crop protection products. TechnoServe reports delivering a package of crop protection products to 4,569 farmers in Côte d'Ivoire through a credit program that delivered inputs to cooperatives on credit, which is guaranteed jointly by industry partners, CLP, the cooperative and the input supplier. However, in interviews with TechnoServe managers, they cited competition from a number of similar packages available to cooperatives. For example, one cooperative interviewed in Côte d'Ivoire reported buying crop protection products directly from the supplier Louis Dreyfus in bulk at a 25 percent discount from the market price and providing the products to members on credit. However, the scale of these distribution systems is not clear. According to data provided by SOCODEVI, 13 of the cooperatives they supported sold crop protection products to their members.

Figure 10: Reported Use of Cocoa Inputs (2013 Household Survey)

Input Used	Cameroon	Côte d'Ivoire	Ghana	Nigeria
Pesticide (at least once in last 12 months)	87.4%	72.7%	92.4%	91.4%
Herbicide (at least once in last 12 months)	42.9%	38.4%	52.4%	49.5%
Fertilizer (at least once in last 12 months)	11.9%	22.6%	35.2%	33.6%
Hybrid Planting Material (Planted new hybrid trees in last 3 years)	71.7%	47.2%	78.3%	85.2%

In some countries, farmers reported that the government distributed some crop protection products, but in all cases, there were problems with the supply and distribution of these products. Ghana had the most extensive government distribution system for pesticides, with a mass spraying program. According to one COCOBOD representative, the government was supposed to distribute pesticides to the head of the districts, who would in turn organize a spraying gang which were supposed to spray farmers' trees. However, farmers frequently reported that they never received spraying from the government, and there were reports of widespread corruption in which spray gangs would smuggle the products to Côte d'Ivoire and either not spray the products at all or spray counterfeit products. In Cameroon, farmers reported getting a small quantity of fungicides from the government, but in such small quantities that it didn't make an appreciable impact on their needs.

Though farmers in group interviews cited more efficient and correct use of inputs as a major result of FFS training, there was also evidence that farmers do not always use crop protection products correctly. Like the practices considered under evaluation question 3, farm inspections completed for the Dalberg report showed flaws in the application of these practices. In Côte d'Ivoire, auditors found that pesticides were applied correctly in only two of 19 farms visited. In Ghana, this number was five of 15. In group interviews, the evaluation team found evidence of numerous misuses of products. One group of FFS trainers in Cameroon, only five of 16 reported using any safety equipment themselves when applying chemical products, and none of those said they had a complete set of equipment (suit, mask, boots and gloves). In Nigeria, multiple technical partners reported that farmers were overusing pesticides and in Ghana, farmers often expressed that they did not have protective equipment to wear when applying chemicals. TechnoServe managers said that a major

advantage of their input supply program was that they offer comprehensive training on application of inputs, provide safety equipment and, in the case of Côte d'Ivoire, train dedicated staff in the cooperative to apply all inputs on behalf of the members.

Improved Planting Material

In all four target countries, the government operates a research organization that grows and distributes hybrid varieties of cocoa pods and seedlings that have the potential for higher yields than traditional varieties. In Ghana, one government representative reported that 60 percent of the cocoa tree stock in the country is now the high-yielding variety. Though the evaluation team did not have access to data to confirm this figure, COCOBOD managers explained that they have an aggressive strategy to replant areas that have been infected by cacao swollen-shoot virus and other diseases using high-yielding varieties, which has helped increase the stock of hybrid varieties. COCOBOD also supports cutting down old trees and supplying hybrid seeds to the farmer. While the evaluation team did not get similar figures on the total hybrid tree stock in the other countries, farmers in all countries reported that the supply of these planting materials did not meet their demand. In one group interview in Côte d'Ivoire, only one of 14 farmers reported successfully obtaining hybrid seeds. In Côte d'Ivoire, technical partners estimated that only 10 percent–40 percent of demand for improved planting materials was met by the government research institute. One dissenting view came from an ANADER manager, who said that anybody who meets minimum qualifications can obtain free planting materials. According to his explanation, farmers must apply to ANADER and demonstrate that they own their cocoa farm and that they have properly prepared their field for replanting. It is possible that these procedures may be creating a bottleneck or that many farmers are not fully prepared to replant their fields, but another ANADER manager confirmed the more common view that the government simply cannot keep up with demand for hybrid planting materials.

Qualitative findings in Cameroon were similar. In one group interview discussion there, every farmer attending reported having trees over age 40, and only three of 17 reported replanting any part of their plantation. Those who did report replanting cocoa trees said they were replacing individual trees as they become old or diseased, but not replanting whole plantations. Farmers explained that planting materials were provided at a small fee from the Cameroon government, but there were dissenting views about whether the total supply was limited or not. In one group interview discussion, farmers first said the government didn't supply them with sufficient planting materials, but a manager of the cooperative denied this, saying all requests were passed through the cooperative and fulfilled. When pressed further, the farmers said they hadn't replanted because they couldn't afford the lost income from cutting down a portion of their plantation. While this was not the most common point raised about hybrid varieties, the lost income in the years before new trees begin to fruit could be a significant deterrent to replanting.

In Nigeria, farmers reported that their farms are old and there are not enough hybrid seeds. However, under the government's Agricultural Transformation Agenda to boost cocoa production, the Cocoa Research Institute of Nigeria (CRIN) is hoping to distribute 1 million tons of hybrid cocoa pods to farmers by 2015. In 2011, CRIN released their own 18-month variety of cocoa and have seed gardens all over Nigeria. That year, they were supposed to raise 3.6 million pods; however, they were able to produce only 500,000 hybrid pods. In Ondo state, FFS trainers reported that they asked for 80,000 pods last year but received only 25,000, even though CLP gets priority on the seeds. One CLP training supervisor expressed that there are not enough pods in Nigeria because CLP has introduced the training about community nurseries and the demand has gone up. In addition, according to the trainers, last year CRIN went on strike, which limited the number of farmers who received pods or seedlings.

In addition to the total supply, there was evidence of problems with the coordination in these centralized distribution models. One technical partner in Côte d'Ivoire explained that there are only three distribution centers for improved planting materials in the country. Similarly, in Cameroon, a government representative

explained that even though there is an overall shortage of planting materials, some distribution centers have seedlings that have grown into full-sized trees due to poor coordination. In Ghana, farmers reported that they weren't able to obtain hybrid seedlings because of timing and lack of transportation to collect them. Farmers said they were too occupied with harvesting in January and February when the planting material became available. Once farmers were ready to collect the planting materials, the seeds had already been purchased. Some farmers also alluded to the fact that larger farmers bought them and then tried to resell them at a profit. Alternatively, the technical partners expressed that farmers were not making it a priority and could organize themselves to come pick up the planting material.

In this survey, the evaluation team found that significant majorities of farmers in most countries reported planting some hybrid variety seeds in the last three years (see Figure 10). The lowest percentage of application was in Côte d'Ivoire, a finding that was consistent with farmers there who emphasized in group interviews that they faced difficulty in obtaining hybrid planting materials. This survey did not capture data on the quantity of hybrid trees planted, so it is not possible to determine from this data if demand was met.

In qualitative research, the evaluation team found that community nurseries had helped farmers access improved planting material, but many farmers in all countries reported that there was not adequate supply from the government supplier. In the context, it appears that CLP activities may have helped prioritize their beneficiaries for access to planting materials but that the target countries still have an overall supply deficit. In CLP's official M&E data, they reported that 30,000 farmers received improved planting materials. For example, in ANADER's reporting to WCF in 2012, they recorded 82,750 hybrid cocoa pods distributed to 1,962 farmers to cover 1,655 hectares. However, CLP documents do not make it clear if supply exceeded the normal amount that ANADER receives from CNRA. Similarly, one matching grant recipient in Côte d'Ivoire reported distributing 345,284 hybrid cocoa pods to farmers in 25 cooperatives, but the representative from this industry partner explained that the seedlings were sourced from CNRA and they were able to obtain them because of a personal connection with CNRA. Since this supply also came from CNRA, it does not appear that this activity relaxed the bottleneck in supply at the level of the country, but rather appears to have given members of these cooperatives priority access.

However, qualitative research suggested two avenues by which project activities may have increased the use of hybrid planting materials: demand for improved planting materials may have increased due to training and farmers may be more effectively using the government supply due to training to set up community nurseries. In both Ghana and Nigeria, the increase in community nurseries has increased the supply of pods. In Nigeria, the two FFS master trainers in Ondo state explained how there has been a burst in cocoa production and TCU seedlings are not adequate. Under CLP in 2010, 20 nurseries were established in Ondo state in 20 communities. In 2011, 22 new nurseries were established, and in 2012, CLP established 29 new nurseries. In 2013, there had been 28 new nurseries established under CLP and an additional 66 were established by the Technical Centre for Agricultural & Rural Cooperation (CTA). Some farmers even reported starting their own nurseries and selling to other farmers. In addition, the evaluation team found on its visits to the FOs in Ghana and Nigeria that had nurseries, although there has been an increase in seedlings, they were still not always meeting farmers' demands.

Fertilizers

Ghana was the only country of the four where the evaluation team found qualitative evidence of significant use of fertilizers. It appeared that this was because the government heavily subsidizes fertilizers. However, in group interviews, farmers said that government-supplied fertilizers often come too late to be effective. According to government representatives, these subsidies will also be phased out in the coming years, which could have an impact on farmers' access to fertilizer since according to the group interviews it is already challenging for farmers to afford fertilizer.

In Côte d'Ivoire, few farmers reported using fertilizers, most often citing the high cost as a deterrent. One technical partner corroborated this, saying that fertilizers are both too costly for farmers and too expensive for the private sector to risk providing on credit. Another technical partner agreed, but said that the returns to fertilizer are worth the cost, so farmers should be further trained to make this investment. In Cameroon, farmers also frequently reported that they couldn't afford fertilizers; however, participants in one group interview reported that some farmers believe fertilizer can damage the soil. This perception appeared more prevalent in Nigeria. In one cooperative that was interviewed, only seven of 53 farmers had applied fertilizer. Farmers frequently expressed that there is no problem with the fertility of the soil, so fertilizers are not necessary. Although training is slowly changing this perception, there is still a challenge with cost. The Nigerian government has been working through CRIN to approve and promote fertilizer. As of 2013, Teractiv fertilizer is being imported from Morocco and is being tested to determine if it addresses the soil conditions specific to cocoa farmers in Nigeria. The government also started subsidizing fertilizer through redemption centers, where two bags are available per farmer. However, fertilizer has arrived late, is still expensive and was in limited supply.

The data from the 2013 household survey corroborated some of the qualitative findings, but not others. The highest rate of fertilizer use was in Ghana (see Figure 10); however, at 36 percent, this rate was lower than expected based on reports of widespread use. Lower reported rates in Cameroon (14 percent) and Côte d'Ivoire (25 percent) were expected, but the rate of application was unexpectedly high in Nigeria at 34 percent, which was up from 6 percent in the baseline study. This could be preliminary evidence that the government's promotion of fertilizers has led to increased usage.

In qualitative research, the evaluation team did not find extensive evidence that CLP I had improved access to fertilizers. The only activity that directly supplied fertilizers to farmers was TechnoServe's credit input scheme in Côte d'Ivoire and Ghana. However, according to their reporting, only 475 farmers received fertilizer on credit in Côte d'Ivoire, while 2,524 farmers received fertilizers on credit in Ghana in 2012. BSCs supported by the program also sold fertilizers to farmers in several cases. Beyond this direct provision, it is possible that farmers who received training in FFS or FBS may have been inclined to use additional fertilizers. In the analysis of the 2013 household survey data, the team found a positive, statistically significant association between FFS training and reported use of fertilizers in Nigeria. This association was not statistically significant in the other three countries. This provides preliminary evidence that FFS/GAP training may have contributed to a trend of increasing fertilizer usage in Nigeria.

Evaluation Question 5: What are the unintended, positive and negative impacts of CLP Phase I interventions on cocoa and food crop production? What are the spillover effects of the CLP cocoa intervention on other crops (e.g., GAP training on cocoa have spillover effects on other crops? Access to finance?)

Evaluation Question 5: Summary Findings on Unintended Impacts

Key Impacts

- The rollout of FFS and FBS training has had a transformative impact on the national extension agencies in Ghana, Côte d'Ivoire, and Nigeria. These extension agencies have adopted FFS and FBS in their mainstream extension services.
- FFS/FBS training in Ghana has led to the creation of many new farmer organizations. This has proven to be an effective model for organizing farmers on a large scale.
- Among farmer organizations that received capacity building services through CLP I, several have become major players in their communities, providing social services such as building health centers and roads.
- CLP I brought together many diverse stakeholders in the cocoa sector including national extension agencies, microfinance companies, input suppliers, and competing private cocoa exporting firms to work on promoting cocoa productivity in a coordinated way.

Discussions on the other seven evaluation questions explore the unexpected findings for each. In this section, we highlight several of the most significant unintended impacts, both positive and negative, that emerged from research into the other evaluation questions.

Integration of FFS/GAP and FBS Training Methods into Extension Agencies' Mainstream Training Methods

Interviews with technical partners and government partners in all countries suggest that the shift to implementing FFS/GAP training through government extension agencies may have helped improve the governments' overall extension services. In Côte d'Ivoire, one technical partner reported that a major impact of CLP I interventions is that the national extension agency, ANADER, has integrated the FFS training approach into its mainstream extension services. He explained that this was a major shift from their prior approach, which relied on demonstration fields; the new approach provides more hands-on experience to help change farmers' behavior. He expressed optimism that they would continue to use this approach across their national extension services after CLP ends. In Ghana, interviews with COCOBOD managers suggested that the CLP training methodology was also fully adopted in government extension services. In addition, all cocoa extension agents also teach FBS to their farmer groups, which was adopted from CLP. In Cameroon, the evaluation team observed less direct involvement from the government in the cocoa productivity training; however, the head of the National Cocoa Board expressed interest in expanding the use of this methodology. In Nigeria, the government has fully embraced the methodology and provided additional funding to WCF to expand GAP/FFS and FBS training to another 70,000 farmers in five states.

Creation of Farmer Organizations Through FFS/FBS Training.

While it was not stated as a goal in CLP I's proposal, an apparent important impact of CLP activities in Ghana is the creation of many new farmer organizations. COCOBOD extension agents consistently reported that they were trying to convert their training groups (i.e. the groups that received both FFS/GAP and FBS) into informal or formal farmer organizations. It appears that this was, in part, because it was a priority for COCOBOD. The director of the COCOBOD unit responsible for extension services emphasized to the evaluation team that, as the government phases out free spraying services and subsidized fertilizers, farmers will need to help each other. COCOBOD extension agents were also able to support the formation of farmer

organizations because they stayed in communities for three years, allowing them to continue following up with groups they trained. Another factor that appears to have helped in the creation of these groups was TechnoServe's credit input program in Ghana.

According to TechnoServe, they made loans to solidarity groups, which were normally drawn from an FFS/GAP training group. This service may have created an additional incentive for FFS/GAP groups to continue working together as formal or informal organizations. Evidence from the evaluation suggested that this might have been a successful approach in creating new farmer organizations. In Akim Oda, the evaluation team observed that a formal farmer organization was created by combining 60 training groups. While this impact was mostly clearly observed in Ghana, one manager at ANADER in Côte d'Ivoire also reported that farmers in FFS training groups supported one another and worked together after the training, more than expected. In the communities the evaluation team visited in Cameroon, FFS training was most often delivered by members of a cooperative. In one case, the leadership of a cooperative showed the evaluation team a record of their activities, which showed that delivering FFS training was their most important activity. While the FFS trainers were paid directly by CLP and overseen by the Ministry of Agriculture, these cooperatives had clearly taken ownership of the process, which may have encouraged farmers who were trained to join their cooperatives.

Helping Build Momentum for the Movement of Certifying Farmer Organizations

Though the CLP I proposal did not include certification of farmer organizations as a goal of the program, interviews with FOs in Côte d'Ivoire and Nigeria suggest it may have helped them get certified. In interviews with the management of FOs, they frequently cited this as a major goal of strengthening their cooperative because they receive a bonus for certified cocoa, and because it creates an incentive for farmers to sell through the cooperative and for exporters to support cooperatives. SOCODEVI reports that 29 of 33 cooperatives they supported got certified during the program. While this process was led by the cocoa exporters and cannot be attributed directly to CLP I activities, there was evidence that CLP I trainings helped these cooperatives attain that goal. A common response in interviews with industry partners was that FFS/GAP training laid the groundwork for certification, helping to ensure that farmers meet the requirements for certification.

Cooperatives Provide Social Services

Qualitative research found that several of the most successful farmer organizations offered social services or other services beyond marketing cocoa. At the two most successful cooperatives visited in Côte d'Ivoire, leadership reported that they had built social infrastructure for the communities they serve, including health centers, schools and roads. One cooperative also reported purchasing health insurance for its members. The evaluation team did not gather any evidence on the services provided by cooperatives that did not receive support from CLP, so it was not possible to determine the extent to which these activities can be attributed to program activities.

Uniting Diverse Stakeholders in Cocoa Production

In key informant interviews, a major impact cited by many technical and industry partners was that CLP I activities helped bring many stakeholders to the table to work together. When asked to cite the largest impact of CLP activities, a manager said this was among the program's greatest impacts. While this was not an explicit goal of the program, the evaluation team saw evidence that this could be one of the most important long-term impacts of the program. In Côte d'Ivoire and Nigeria, all industry and technical partners cited regular country meetings between government and technical and industry partners as an effective platform to share information. Because of the scattered and diverse activities of these actors to improve cocoa production, this improved collaboration could have wide-reaching effects. For example, industry partners in Côte d'Ivoire reported having an array of different monitoring systems in place, which collect data on the yields of the farmers they support through their corporate social responsibility (CSR)/sustainability programs.

Spillover effect on other crops

In group interviews with farmers and key informant interviews with implementing partners, the evaluation team found initial evidence that FBS and FFS/GAP training may have had a spillover effect on other crops. Though FFS/GAP focuses more on specific practices for cocoa farming, a COCOBOD representative argued that the training makes the participant a better farmer overall and that some of the general farming concepts can be crosscutting to other crops. In Côte d'Ivoire, one farmer explained that after learning to intercrop cocoa fields with banana trees, that banana trees had become an even more important crop to her than cocoa. However, farmers most often reported that FFS training focused very closely on specific cocoa farming practices. By contrast, both implementing partners and trainers frequently reported that farmers who received FBS training applied their farm management skills to other crops. In Nigeria, for example, one FBS trainer explained that farmers who don't grow cocoa expressed interest in taking the FBS course to learn about farm management skills. If there was space available some of the trainers would let them participate. In addition, GIZ mentioned working to expand FBS to be given to non-cocoa farmers. The evaluation team also found evidence supporting farmer organizations that focused on cocoa, also may have had a spillover effect improving their members' sales of other crops. For example, one cooperative in Cameroon reported running a program to help their members grow and market cassava.

Evaluation Question 6: How has CLP I influenced farmer choices with regard to on-farm investments? What are the considerations for farmers to continue cocoa farming or diversify into other crops?

Evaluation Question 6: Summary Findings Related to On-Farm Investments

Key Impacts:

- Farmers in all countries reported diversifying their crop production as a result of the guidance of FBS training to diversify crops in order to mitigate risk. Farmers also reported inter-planting cocoa with other crops, especially banana trees, as a result of trainings.

Other Findings:

- According to the household survey, cocoa income fell as a proportion of total reported income of farmers in all countries and non-agricultural increased as a proportion of total reported income.
- Key informants reported that because of the low profitability of cocoa farming, few youth are willing choose to go into cocoa farming. This was confirmed by the household survey, which showed that the median age of cocoa farmers was in the 40s in all countries.
- Though data from the household survey showed that more than 90 percent of cocoa farmers own their farms, key informants suggested that sharecropping is a prevalent arrangement and could impede farmers' ability to make long-term investments.

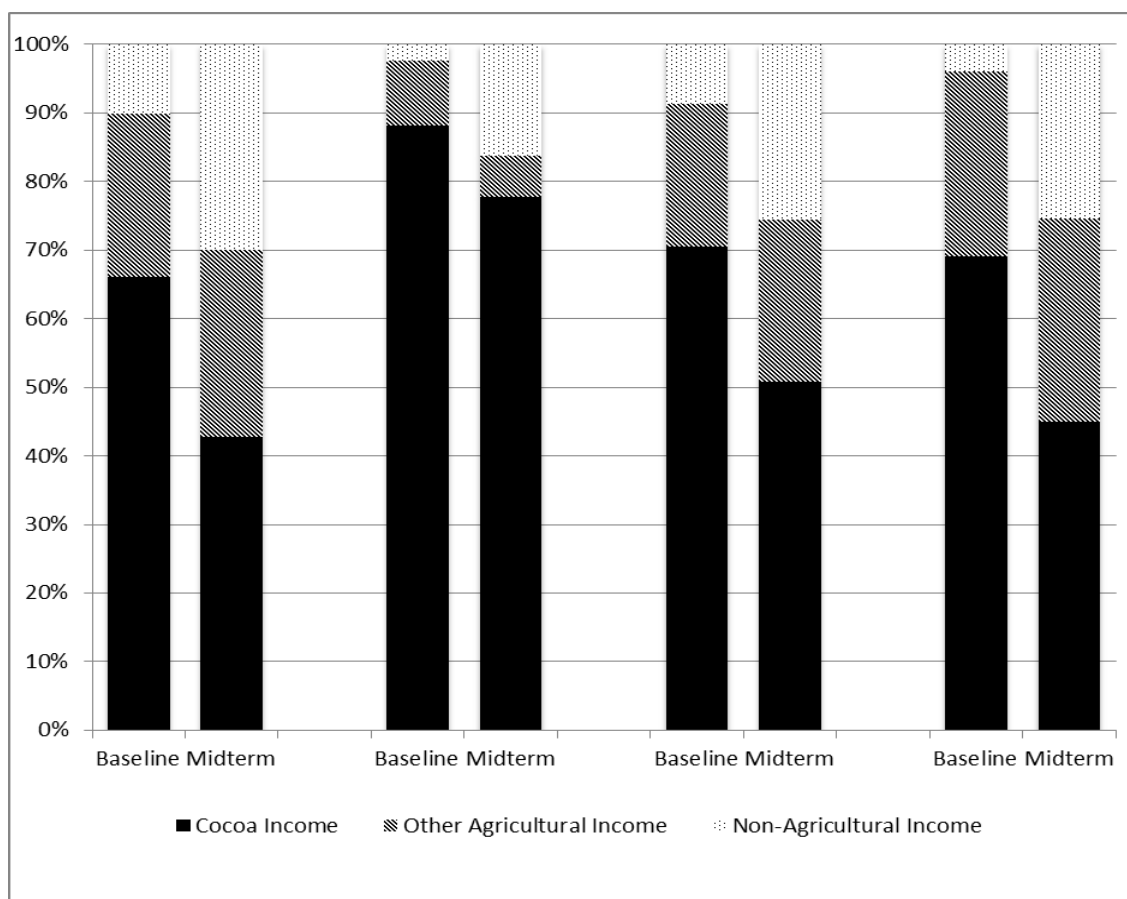
In the findings to evaluation questions 1–4, the team looked for direct evidence that CLP interventions influenced the behavior of beneficiaries and ultimately affected their yields and income. However, farmers make a wide range of investment decisions that contribute to the potential productivity of their cocoa farms. In this section, we look more broadly at farmers' investment decisions and how CLP interventions affect these decisions. We first look at the overall household economy of cocoa growing families, and then consider the evidence pointing to underlying factors that affect farmers' decisions to invest, diversify or scale back their cocoa farming. Finally, we look at the ways that CLP activities may have influenced those investment decisions.

Composition of Farmers' Sources of Income

The data from the 2013 household survey shows that cocoa farmers in all countries engage in diverse economic activities, and that the proportion of income from cocoa farming varies significantly by country (see Figure 11). In the baseline study, farmers in Côte d'Ivoire earned the largest portion of their income from cocoa, at 83.7 percent, but this was down to 80.2 percent in the midterm 2013 study. Cameroon had the largest drop in farmers with the largest portion of their income coming from cocoa - 64.4 percent to 37 percent. In all countries, the proportion of income derived from cocoa decreased, while the income from nonagricultural sectors (i.e. wages, selling goods, etc.) and the proportion of other agricultural (all non-cocoa crops) income increased, except for in Côte d'Ivoire.

The most commonly grown food crops in each country are presented in Figure 12. Across countries, there was some variation of food crops grown, but the top five grown, sold and consumed in Côte d'Ivoire, Cameroon and Nigeria were the same: banana, cassava, cocoyam, corn/maize, and plantains. Where Ghana grew more yams rather than bananas, but its other four top food crops were the same.

Figure 11: Proportion of Total Income from Different Sources of Income in Baseline Survey and 2013 Household Survey



The baseline showed an increase in the proportion of cocoa farmers producing, growing, and selling maize, cocoyam, and bananas in Ghana, Nigeria and Côte d'Ivoire. In Ghana and Nigeria there was also an increase in plantains, cassava and citrus. In Cameroon and Côte d'Ivoire, the proportion of farmers who reported growing plantain, cassava, yam and citrus all decreased. In Nigeria, Côte d'Ivoire and Cameroon the largest increase was in bananas; in Ghana, it was cassava. The data suggested there were several changes, which are analyzed in Annex E, Table E.2²¹.

Figure 12: Top Five Crops Most Commonly Grown & Consumed in Each Country (2013 Household Survey)

Crop	Cameroon	Côte d'Ivoire	Ghana	Nigeria
Banana	40%	12%		51%
Cassava	55%	49%	82%	48%
Cocoyam	23%	16%	47%	17%
Maize	26%	26%	26%	22%
Plantain	80%	33%	80%	69%
Yam			30%	

Factors Affecting Farmers' Investment Decisions in Cocoa Production

One common theme raised by farmers and other key informants in qualitative research was that farmers make investment decisions that respond to the price of cocoa. Some good agricultural practices, such as use of inputs, require significant financial investment; others, such as weeding, removing diseased pods and timely harvest, involve important investments of time. Since prices have declined in all countries since the beginning of the project, we would expect to see a reduction in farmers' investments in cocoa farming. Members of cooperatives in Côte d'Ivoire and Cameroon frequently expressed that the current selling price of cocoa puts it on the edge of being unprofitable. A government representative in Cameroon expanded on this, saying that few youth are willing to go into cocoa farming because the income is less than they could get from even low-skill, informal sector work in urban areas. This view was reiterated in all four countries, but in addition to the low profitability of cocoa, respondents also argued that youth don't want to go into cocoa farming because of a preference for urban lifestyle and cultural change.

Figure 13: Age Distribution by Country (2013 Household Survey)

Age Range (Years)	Cameroon	CDI	Ghana	Nigeria
18 – 29	7%	23%	7.4%	6%
30 – 39	19.9%	24.2%	20%	12%
40 – 49	20.1%	28.4%	29.1%	25.8%
50 – 59	26.7%	16.9%	26.5%	22.1%
60+	26.2%	7.5%	17%	34.1%

²¹ The 2013 household survey on food crops was collected differently from the baseline study. In baseline, farmers were asked about their production of several common crops and then asked if they grow any other crops. The 2013 survey asked farmers to list any crops grown. Although the bias is most likely minimal the evidence of changes in food crop production should be interpreted cautiously.

In all countries, trainers reported that few youth participated in FFS training; in Nigeria, some interviewees estimated that the average farmer age was 55 to 60, which was supported by the 2013 Household Survey data (Figure 13). In all countries, technical and government partners discussed the importance of making farming attractive to young people to increase their involvement. In Nigeria, trainers reported that they are required to prioritize youth inclusion when selecting participants for their trainings. In addition, SOCODEVI reported holding events to encourage youth involvement in cocoa farming. A technical partner also mentioned that in the Cross River area, there is a higher portion of young farmers. Although this interviewee did not know the specific reasons for why this was the case and this area was not visited during this evaluation, they suggested that this could be linked easier access to land through government leased farms. However, this issue would need to be further explored to determine exactly why more youth farm in that region. Nonetheless, this suggests that the youth exodus from cocoa farming is not inevitable, but this trend needs to be studied more closely.

A related theme from the qualitative research is that farm size may affect investment decisions. Several industry partners raised the concern that small farms of 3 or fewer hectares are too small to generate significant income. One industry partner argued that farm sizes need to be 10 -30 hectares to generate significant revenue. This industry partner said that to address the farm size issue, governments must allow failing smallholder farmers to be pushed out of cocoa farming so cocoa plantations can be consolidated into larger units. Another industry partner reiterated these views saying that smallholder farming should not be considered inevitable because it is the current norm. Qualitative research provided some initial hypotheses on the causes of the trend for farm sizes to shrink. Several technical partners cited the system of inheritance as a major cause for diminishing farm sizes. In some parts of Nigeria and Ghana, it was reported that the family farm is divided equally among all the children and very few choose to sell the land, which limits other farmers' abilities to own or expand their farms. In the 2013 survey, very few farmers reported buying new land.

However, analysis of data from the 2013 survey data did not corroborate the view that those with larger farms invest more in cocoa farming than their counterpart with smaller farms. In regression analyses, we did not find a positive association between use of inputs and farm size. In one model, we find that farmers with larger farms are not more likely to use inputs including fertilizers, pesticides and herbicides. In another model, we found that farmers who use these inputs use less per hectare on average as farm size increases. These findings²² cast doubt on the theory that farmers with larger farms are more willing or able to invest in their farms.

An important factor relating to landownership that may affect cocoa farmers' investment decisions is sharecropping. Though few farmers in the 2013 household survey did not own their land, group interviews in Ghana and Nigeria suggest that sharecropping is the prevalent arrangement in certain areas and could have been missed by the sampling model. Three of the nine farmer groups interviewed in Ghana were made up almost entirely of sharecroppers. In Oda, approximately 90 percent (21 members) of the group was sharecroppers; in Nyamakrom, all 65 members of two groups interviewed were sharecroppers. In Nigeria, one technical partner stated that the majority of farmers in Nigeria are sharecroppers. However, of the three cooperatives interviewed, one reported no sharecroppers and the other two did not have any data on sharecropping rates. Sharecroppers interviewed in Ghana often came from distant areas and, despite residing in some communities for 10 to 30 years, were remitting their earnings to their home areas to build houses and save money for their retirement years.

Technical partners in both Nigeria and Ghana suggested that sharecropping farmers have little say on long-term investment behavior, such as delaying replacement of older trees. In Ghana, depending on the

²² See Annex E, Tables E.4 for complete results of the regression models.

arrangement with the landowner, the farmer has limited decision power on farm investments such as replacing trees or even diversification, limiting their options for farm investment even if they are willing to pay for it themselves. These arrangements may also make it more difficult for farmers to increase their household's income depending on the negotiated profit-sharing, which is usually 50:50 or 33:67, with varying agreements about factors such as the purchase of inputs. In Nigeria, one technical partner argued that migrant workers do not make long-term investments because they do not know how long they will be farming a particular piece of land. Because the overwhelming majority of farmers in the 2013 household survey reported owning their farm, it was not possible to test these claims through analysis of this survey's quantitative data.

In group interviews, farmers frequently reported that as they gained additional income from cocoa sales, they reinvested that money in cocoa production, purchasing inputs or equipment, hiring labor, growing additional crops and, although rarer, sometimes purchasing more land. Regression analysis of the household survey data provided support for this claim: in Côte d'Ivoire and Cameroon, there was a statistically significant, positive relationship between cocoa income and use of all inputs. In Ghana, this relationship was found only for fertilizer and pesticide; in Nigeria, there was no relationship shown at all.

In some areas, cocoa experts reported that farmers are transferring their investments away from cocoa into crops they believe are more profitable, especially rubber in Côte d'Ivoire. One industry partner reported that rubber is three to four times more profitable than cocoa, and another reported that it provides a more constant stream of income, since it can be harvested every three months. However, other respondents suggested that this trend is not as much of a threat to cocoa production as commonly believed. One industry partner explained that only farmers with larger farms are replanting part of their plantations with rubber, whereas the smallholder farmers, who produce most of the cocoa, are not. This industry partner also argued that new taxes on rubber have eroded its competitive edge over cocoa. In Cameroon, one government representative explained that farmers may be converting cocoa production to cassava for similar reasons: a new high-yielding variety of cassava can be harvested more often and is more profitable. However, analysis of the 2013 quantitative survey did not provide strong evidence to show that cocoa is being replaced by either of these crops.²³

In contrast, farmers in Nigeria and Ghana group interviews reported new interest in investing in cocoa farming and see it as profitable. This was also supported by the quantitative findings in Nigeria and Ghana, where there were larger increases in the portion of income coming from cocoa as well as nonagricultural income. This seemed to be attributed to both participating in the GAP/FBS training and political actions, particularly in Nigeria, in which the government is prioritizing and investing in the cocoa sector through new initiatives (for example, the Cocoa Transformation initiative and a new partnership with WCF to expand CLP activities to new regions).

Effect of CLP Activities on Farmers' Investment Decisions

CLP activities may have affected cocoa farmers' investment decisions in several ways. Most directly, FFS and FBS may have persuaded farmers to invest more in cocoa farming by increasing or improving their use of inputs, replanting of plantations and investment of time. Under the findings for evaluation questions 3 and 4, the evaluation team examined this hypothesis. However, CLP trainings, FBS and FFS, were designed to also encourage farmers to invest in other crops: FBS encouraged diversification as a means of mitigating risk, supplementing income, and maintaining good nutrition, while FFS training encouraged intercropping when planting new cocoa farms; and BSC promoted additional crops by selling improved seeds and inputs for other crops.

²³ See Annex E, Tables E.5 and E.6.

In group interviews, farmers and technical partners in all four countries reported that cocoa farmers have always grown other crops alongside cocoa. Some farmers reported that, although they were planting food crops for consumption before, after the FBS training they began to sell surpluses of these crops as well as grow new crops for income. Farmers also reported that the trainings taught them what types of crops grow well with cocoa, encouraging diversification both through intercropping and mix cropping. In some cases, farmers said they made dramatic changes after FBS training: one farmer in Côte d'Ivoire reported she converted her 0.5 hectare plot from exclusively cocoa to a variety of crops including cassava, yam, peanuts, bananas and taro in addition to raising pigs. Such examples, however, may not be representative of a broader trend. Since farmers nearly universally reported that they had grown other crops alongside cocoa before the training, it was difficult to attribute increases in food crop production to CLP on the basis of group interviews.

While it was difficult to attribute crop diversification to CLP I based on group interviews, farmers did report several lessons from FBS training that they say prompted them to grow additional crops. Farmers in two cooperatives in Côte d'Ivoire and farmers in Ghana said FBS taught them to use other crops to smooth their income since they can be harvested and sold at other times of the year. Farmers and technical partners in all four countries reported that another impact of FBS training was to encourage farmers to sell food crops rather than simply producing small quantities for personal consumption. Another factor mentioned twice by farmers in Ghana was that the FBS nutrition component influenced their decisions to grow food that changed their family's diets. One farmer explained that before FBS, his family ate only fufu but he has now incorporated other food such as rice and beans into his family's diet. However, analysis of the 2013 household survey did not provide evidence to support this theory. In most cases there was not a statistically significant association between receiving FBS and diversification but in Cameroon and Côte d'Ivoire, receipt of FBS tends to be associated with a decreased number of crops grown in 2013 compared to the baseline.²⁴ However, it should be noted that these outcomes were only based on the number of crops and not on the volume of crops grown. Therefore it is possible that a reduction in the number of crops grown is accompanied by an increase in the total volume of crops grown, suggesting diversification by intensification rather than by sheer number of crops grown.

In group interviews, farmers also reported the impact of FFS training on diversification. In Côte d'Ivoire, farmers in three group interviews reported planting plantain trees with cocoa when replanting, a practice promoted in FFS/GAP training. In Cameroon, farmers in two group interviews reported intercropping strategies that included citrus trees, palm trees, cassava and corn, which they had not planted with cocoa before. Analysis of the 2013 quantitative data provided initial evidence that farmers who received FFS may be more likely to have increased the number of crops they grow; however, this association was statistically significant only in Nigeria.²⁵

²⁴ Although the corresponding effects vary in magnitude and statistical significance depending on self-reported year of FBS. See Annex E, Tables E.7.

Evaluation Question 7: How have program activities focused on professionalizing farmer organizations improved farmers’ access to services and cocoa sales?

Evaluation Question 7: Summary Findings on Farmer Organizations

Key Impacts:

- Farmer organizations supported by CLP I significantly increased their membership and the volume of their sales. This corresponded with a national trend for increased membership in farmer organizations in all countries except in Cameroon.
- FFS training in Ghana led to the creation of many new farmer organizations.

Other Findings:

- Farmer organizations face significant challenges to build a strong management system and gain the trust of their members; CLP I’s approach to closely coaching farmer organizations appeared to be an appropriate method to meet this challenge.
- In addition to improving marketing efficiency, farmer organizations provided an ideal platform for CLP I to deliver services to farmers including productivity training and input supply.

Part of the CLP I theory of change was that farmers who sell their cocoa through farmer organizations would have a better negotiating position and be able to receive a better price for their cocoa. As such, project activities were intended to promote formation of farmer organizations and expand the membership and sales of cooperatives. Beyond the goal of improving producer prices, CLP I activities also treated farmer organizations as strategically important mechanisms to help improve their members’ access to inputs and services to increase their production. In this section, we separately consider these two goals of CLP I interventions: expanding membership and group sales of cooperatives and improving access to inputs and services through farmer organizations. Quantitative data collected in the 2013 household survey was insufficient to estimate the impact of CLP I activities on these outcomes; therefore, in this section, we explore the trends observed in these two areas and possible explanations related to both CLP I activities and external factors.

Farmer Organizations’ Membership and Group Sales

Part of CLP I’s approach was to strengthen existing formal farmer organizations so they would attract more members and increase their group sales. This strategy was primarily implemented in Côte d’Ivoire, Cameroon and Nigeria by SOCODEVI who provided a cycle of trainings, coaching and equipment to help professionalize FOs. These interventions were intended to help the FOs grow, operate more efficiently and provide better services to their members, ultimately leading to increased membership and sales. However, due to significant differences in the sector in each country, CLP interventions and their outcomes varied significantly among the three countries.

Figure 14: Percentage of Farmers Surveyed Who Report Belonging to a Farmer Organization

	Cameroon	CDI	Ghana	Nigeria
2010	35.0%	20.4%	16.9%	16.9%
2013	28.2%	30.0%	30.7%	32.8%

Cooperatives in Côte d’Ivoire were the most developed and CLP I assisted the most farmer organizations in that country — 24 of the 33 across the three countries. By contrast, farmer organizations in Cameroon and Nigeria were much weaker at the beginning of the program, suggesting that there was an opportunity to increase participation. In several group interviews with the management of cooperatives in Cameroon, interviewees explained that a system of strong cooperatives with ties to the government was dismantled during the structural adjustment of the 1980s and 1990s. Several of the cooperatives interviewed had existed as large associations before structural adjustment, but had been completely dismantled and had reformed in the past few years. In Nigeria, part of SOCODEVI’s strategy was to help unions take advantage of the new government policy promoting the cocoa sector and although the increase cannot be solely attributed to SOCODEVI’s interventions, Nigeria did have the largest increase of membership from 16.9% to 32.8 percent, while Cameroon’s membership decreased from 35% to 28.2% rather than increase like the rest of the countries (Figure 14).

At the end of the project, there were gains in membership. Among cooperatives supported by the program, SOCODEVI’s documentation showed that the overall increase in membership was 68 percent. The gains in membership were more significant in Cameroon and Nigeria, most likely because these organizations were weaker at the beginning of the project. SOCODEVI worked with six FOs in Nigeria and Cameroon and 21 FOs in Cote d’Ivoire and was able to significantly increase their registered members. Comparing this data to the trends in the 2013 household survey data (see Figure 14), both show an overall trend for membership to increase in all countries except for Cameroon, where the 2013 Survey data shows a decrease. Since membership increased in the cooperatives SOCODEVI supported in Cameroon (Figure 15), the evidence supports that SOCODEVI’s interventions helped increase membership in the cooperatives it supported in Cameroon, but not in the country overall. However, gains in membership in the other countries could have contributed to the overall trend of increasing membership in these countries.

Figure 15: Membership of FOs Supported by SOCODEVI

	Cameroon	CDI	Nigeria	Total
2010	727	8,358	1,698	10,783
2013	1,308	12,029	4,805	18,142
% Change	80%	44%	183%	68%

SOCODEVI’s annual report for 2012 credits three factors for the increases in membership of the cooperatives they supported: (1) premiums received for cocoa certified through the cooperative, (2) improved auxiliary services offered by cooperatives and (3) improved governance in the cooperatives. Of the three explanations for the increases in membership, improved governance is the most closely attributable to CLP training. In group discussions, FO leaders frequently affirmed that the trainings they received in recordkeeping, financial management and roles and responsibilities helped improve the management of their organization. While it is difficult to quantify the direct effect of this support, interviews with technical partners provided several explanations for how poor governance could significantly hamper the business operations of cooperatives and their ability to attract and retain members. One technical partner provided two examples of farmer organizations supported in Côte d’Ivoire that struggled with serious problems of mismanagement and embezzlement and turned to SOCODEVI to resolve major problems. In Nigeria, an official at the Ministry of Cooperatives reported that other cocoa farmer organizations were impressed by the results of SOCODEVI’s support to cooperatives and have asked to receive the same assistance.

Likewise, in group interviews with farmers and the management of farmer organizations, trust was a major concern. In one of the most successful cooperatives in Côte d’Ivoire, members reported in a group interview that there were “no secrets” within the cooperative. In a separate interview, the cooperative’s management reported making conscious efforts to meet frequently with their members and to call special meetings

whenever conflicts arise. Notably, a technical partner reported helping to mediate a significant problem with this cooperative related to claims of systematic embezzlement early in the program. Conversely, in cooperatives that were struggling to retain members and increase their group sales, distrust appeared to be an important constraint. Farmers in one Cameroon cooperative openly accused the management of representing an exporter’s interests against theirs; the representative of the management in turn said that it was difficult to organize group sales because farmers didn’t trust the cooperative enough to give them cocoa to sell.

Figure 16: Reasons Farmers Report Joining Cooperatives (2013 Household Survey)

Response	Proportion at Midterm - Co-op Members Citing Noted Response			
	Cameroon	Côte d’Ivoire	Ghana	Nigeria
Obtain Training	71.6%	48.3%	87.8%	73.8%
Obtain Certification	25.4%	44.8%	20.4%	26.2%
Better Access to Inputs	25.4%	53.7%	42.2%	33.0%
Better Access to Credits	7.5%	36.0%	18.3%	34.0%
Obtain Better Price	43.3%	74.4%	30.0%	43.7%

It is difficult, however, to separate the impacts of CLP training and support that cooperatives received from industry partners. SOCODEVI reports that 29 of 33 cooperatives supported by CLP I have either become certified or are in the process. While SOCODEVI supported this process, it was part of CLP I’s original intervention and involved additional support from an exporter. In each case, the cooperative was sponsored by an international exporter, who provided support to the cooperatives to meet the standards for certification. In some cases, it appears that these trainings may have some overlap with SOCODEVI’s training. For example, one technical partner in Côte d’Ivoire explained that an industry partner provides cooperatives with a training called “co-op academy,” and the board of directors of a cooperative in Côte d’Ivoire reported receiving management training from a different industry partner. In addition to the support provided by industry partners, the trend for cooperatives to seek certification also provides an incentive for cocoa farmers to join cooperatives: they receive a bonus payment for certified cocoa. This could account for some of the growth in membership in farmer organizations. However, it is notable that in Cameroon, where only one cooperative successfully obtained certification during the program, membership increased significantly in supported cooperatives, suggesting that management training could stimulate significant growth where cooperatives are starting from a low level of development.

Unlike the other three countries, there was no recent history of a cooperative movement in Ghana, so CLP I worked to build new farmer organizations. Following GAP training, COCOBOD Cocoa Extension Agents (CEAs) took the initiative to help train groups to remain organized. From the baseline, the percentage of farmers who reported being part of a cooperative in Ghana has increased from 16.9 percent to 30.7 percent. CEAs helped create a structure for the group with a lead farmer, treasurer and chairman. CEAs interviewed reported that the groups created a platform for farmers to support one another and served as the basis for solidarity groups that allowed them to get loans for inputs. The evaluation team found these informal associations in all communities, as well as umbrella associations in some communities that had several thousand members with office and salaried staff. CEAs helped these groups grow and helped them register through the Department of Cooperatives. Notably the Oda Cocoa Farmers’ Association (ODACOFA) in

Akim Oda has been aggregating 60 training groups with a total of 1,800 members. The evaluation team observed that an office has been set up with staff and adequate administrative procedures. The cooperative currently generates income through membership fees and it is in the process of registering with the Department of Cooperatives. In the future, they hope to set up an inputs store for their farmers. In addition to the growth of these more organic cooperatives, Ghana also has larger associations, such as Cocoa Abrabopa. However, these cooperatives are much larger and the main purpose is certification. They also offer input loans to their members.

While there was a clear trend toward increased membership in farmer organizations in Cameroon and Nigeria, the trend in the volume of cocoa sold through farmer organizations is less clear. According to the numbers reported by SOCODEVI, the volume of sales through the cooperatives supported by the program declined from the baseline during the 2011/2012 harvest season. This trend was driven by the decline in sales in Côte d'Ivoire, which SOCODEVI attributes to price competition from Ghana. Technical partners reported that because producer prices were higher in Ghana than in Côte d'Ivoire during that period, farmers smuggled their cocoa to Ghana to sell. By contrast, SOCODEVI reported that the FOs they supported in Cameroon and Nigeria increased their group sales by 147 percent and 245 percent respectively (Figure 17). However, it is important to note that the absolute volumes sold by these cooperatives are still much lower than the cooperatives in Côte d'Ivoire: whereas the average quantity sold through the supported cooperatives in Côte d'Ivoire was 860 tons, those numbers in Nigeria and Cameroon were 180 tons and 78 tons in 2011/12. In the 2013 household survey, we found the three top reasons for joining a cooperative in all four countries was to obtain training, obtain better prices and receive better access to inputs. The top reason the farmers joined cooperatives in Cameroon, Nigeria and Ghana was to obtain training (See Figure 16). In Côte d'Ivoire, the top reason was to obtain better prices, followed by access to inputs and then obtaining training.

Qualitative research confirmed that the business operations of supported farmer organizations in Côte d'Ivoire were much better developed than those in Nigeria and Cameroon were. In Côte d'Ivoire, the evaluation team visited several cooperatives with dedicated staff that were able to correctly verify the quality of cocoa and were in the process of packaging significant quantities of cocoa. By contrast, in Cameroon, only one of five cooperatives visited had significant infrastructure to collect and sell cocoa. In group interviews with Cameroon cooperatives, farmers mentioned several constraints that have prevented greater growth in group sales. The most significant was that cooperatives did not have trucks or storage facilities to collect cocoa on a timely basis from their members. Members of cooperatives said openly that they sold to itinerant buyers because the cooperative could not effectively collect their farmers' cocoa.

In Côte d'Ivoire, exporters lent capital to cooperatives to manage cocoa collection; in Cameroon, these relationships appeared much rarer. In one cooperative, the leadership recounted a series of struggles to establish a relationship with an exporter in which transportation for cocoa didn't arrive on time, so the leadership rented a truck and traveled to Douala, only to be turned away by the exporter. In this cooperative, farmers were so frustrated that they said they believed exporters were purposely trying to destroy cooperatives to keep cocoa producer prices low. In Nigeria, organized farmers reported that they had received better and more consistent prices for their cocoa through their unions than they did when they sold to traders. The relative success in increasing group sales in Nigeria may be because cooperatives supported by SOCODEVI were able to more effectively partner with exporters. Another factor could be that these unions were certified through their exporters and reported improvements to the quality of their cocoa.

Another important issue raised by farmers who constrained the growth of group sales was the delay in payment when selling through a farmer organization. In Cameroon, the members and the leadership of cooperatives agreed that farmers choose not to sell through their cooperative because itinerant buyers will pay them immediately and in cash. Even in Côte d'Ivoire, farmers in one cooperative said this was why more farmers don't join cooperatives, suggesting that poorer farmers are desperate for money and can't wait for

payment through the cooperative. In Cameroon, SOCODEVI had a program in place to provide a credit line to cooperatives through the microfinance organization, FIFFA. The management of several cooperatives in Cameroon reported that this had allowed them to pay their members in advance for the cocoa and increase sales, but FIFFA went bankrupt during the program, so it had to be suspended.

Effect of CLP Activities on Improved Services Provided Through FOs

According to the CLP I proposal, CLP I's primary rationale for strengthening farmer organizations is to improve farmers' market position, the program also used farmer organizations as a platform to provide a range of services. In the program's original proposal, several activities were included to strengthen FOs' "auxiliary services" and to use them as a platform for a risk-sharing scheme. The objectives of these components were both to attract new members and to support farmers in improving their productivity. In Côte d'Ivoire and Ghana, where TechnoServe implemented its pilot input credit scheme, all credit was delivered through cooperatives in Côte d'Ivoire and the informal groups formed in Ghana through GAP training. The provision of credit through cooperatives in Côte d'Ivoire is discussed in further detail under the findings of evaluation question 4. It appears that access to credit through cooperatives expanded during the program, possibly led by TechnoServe's program, which was relatively novel at the beginning of the program. An important aspect of TechnoServe's Côte d'Ivoire program was that they also trained staff at each cooperative on how to safely apply dangerous chemical products, such as pesticides, for the members.

Figure 17: Cocoa Sales for SOCODEVI Supported FOs by Season and Country in Kg

Harvest Season	Cameroon*	CDI	Nigeria	Total
2009/2010	764,000	22,648,380	153,922	23,602,302
2010/2011	1,277,000	22,933,225	310,038	24,520,263
2011/2012	1,081,404	18,056,402	465,040	19,602,846
2012/2013	1,128,942	24,207,477	531,563	25,867,982
% change from 2010 to 2013	147%	7%	245%	9%
% change from 2012 to 2013	4%	34%	14%	32%

**Data for Nigeria and Cameroon are from 6 FOs, CDI is from 21 FOs.*

Farmer organizations also play an important role in productivity training. In addition to training being a key element of the FO interventions, it also turned out to be one of the top reasons as to why farmers joined FOs in all four countries (Figure 16). In countries with existing farmer organizations, CLP I typically worked with exporters to select cooperatives to work with, and those were used as the basis for selecting farmers for GAP and FBS training. In Cameroon, this system was extended and FFS trainers were selected from the cooperative. One cooperative showed the evaluation team their annual report showing FFS training as their primary activity. The trainers, however, are still managed and paid directly by SOCODEVI and, in some areas, they are supervised by a master trainer from the Ministry of Agriculture.

Evaluation Question 8: Have CLP Phase I interventions impacted women significantly and bridged gender gaps in access to training, finance and inputs and participation in farmer organizations? If yes, how?

Evaluation Question 8: Summary Findings on Gender

Key Impacts:

- CLP I trainings included a relatively large proportion of women given the context that the large majority of cocoa farms are managed by men. Female participation was, by far, the greatest in Ghana.

Other Findings:

- Many women work on cocoa farms do not own or manage the cocoa farms, and these women are not typically targeted by CLP trainings.
- Women typically report having difficulty accessing credit; however, data from the household survey showed that this was not the case in Ghana, where the proportion of women who reported receiving credit was nearly the same as the proportion of men.
- Though membership of women in farmer organization is low overall, several of the most successful farmer organizations visited by the evaluation team had women in leadership roles.

In the proposal for CLP I, WCF noted that women are important actors in the cocoa value chain. However, they are the head of only a small number of cocoa-growing households. As planned in the proposal, CLP I conducted a gender assessment to determine how to best target women who head cocoa-growing families and those who are members of cocoa-producing families headed by men. The study was conducted by KIT in September 2012, and found that female land ownership in West Africa is low with about 25 percent of the cocoa land being owned by women. However, the gender labor breakdown is almost equal with women doing around 45 percent of the labor. In addition, it found that women provide 85 percent of the labor in food crop production.

These figures were broadly verified in this evaluation by the group interviews with both farmers and technical partners who typically estimated that 20–30 percent of cocoa land owners were women and that women do a significant portion of the work on cocoa farms (20–60 percent by different estimates) even if they don't own the farms. Key informant interviews suggested that this may be partially the result of a division of labor along gender lines, by which men are responsible for tasks above ground — pruning, spraying, chopping and mistletoe clearing — and women are responsible for tasks on the ground — weeding, planting and fermenting. In Nigeria in particular, numerous farmers said that it is not appropriate for women to apply chemicals or prune trees. This view was reiterated by some technical partners, but was not held universally; some women farmers emphasized that they could do all tasks required for cocoa production. Some men interviewed also estimated that the portion of work completed by women was as low as 10–20 percent. This view was expressed most frequently in Côte d'Ivoire. Older women, typically widows, who owned farms were more likely than others to say that they needed to hire help, as they could not do all the work themselves.

Despite the division of labor in cocoa production, which suggests that women complete a large share of cocoa production tasks, unequal land ownership appeared to be a major contributing factor to the gap between men and women in cocoa-farming households. Because women are often “invisible” laborers on cocoa farms, they may have limited access to trainings, inputs and other services. It also appears that women farm owners face different challenges from other women in cocoa production. In group interviews, nearly all women who owned a farm were widows who inherited their husband's land. In some cases, this meant these women had

less household labor available for cocoa production and were more likely to need to hire labor than male-headed cocoa households.

The household surveys completed for CLP I, the baseline survey and the 2013 household survey, were both based on the sampling methods of the baseline survey and did not adequately capture data on several categories of women who work in cocoa. Critically, in order to be covered by the survey, a farmer must “manage” the farm. This would include women in the category of widows who inherited land but not the wives and daughters of cocoa farmers who work on the farms. Furthermore, several key questions in the survey refer to the entire household. This includes questions on other agricultural income and non-agricultural income. Since these questions would include incomes from female members of the household, this survey does not provide the necessary data on men and women’s different roles in cocoa and food crop production. Finally, qualitative research suggested that there are many women sharecroppers. However, in the 2013 survey, over 90 percent of farmers reported owning their cocoa farm. The reasons for this are unknown, but if sharecroppers were underrepresented in the sample, this could mean that women in this arrangement are also underrepresented. In addition, based on qualitative research, it appeared that CLP I activities also primarily supported women who own their farms, but did not have a direct impact on the other women working on cocoa farming who do not manage a cocoa farm.

In the rest of this section, we examine the challenges that these two groups of women — widows who own a farm and “invisible” women working in male-headed households — face in getting access to trainings and credit and inputs, as well as in participating in farmer organizations.

Access to Trainings

CLP I trainings were open to women, and CLP I actively encouraged women to participate. In interviews with technical partners and CLP I core staff, there was a frequent concern that women were under-represented in productivity trainings even though they perform a significant portion of the labor on cocoa farms. However, WCF’s reporting shows that roughly 25 percent of trainees were women. This was broadly confirmed in qualitative research, in which farmers, trainers and technical partners reported similar figures, but there were important variations. In Ghana, Nigeria and Cameroon, farmers and technical partners reported that female participation has increased since the beginning of the program, and on average is about 20–30 percent in the FBS and FFS/GAP trainings. However this was not supported by the 2013 Household Survey. Ghana had the highest portion, with 39.5 percent of participants being women in FFS/GAP and 44 percent in FBS. Some of the farmer groups interviewed in Ghana had 50 percent women. It was not clearly evident why this was the case, however many women farmers talked about being encouraged to come by other women farmers and that is why they joined. Both Nigeria and Cameroon had similar participation among women for both FFS/GAP and FBS of around 14 percent (Figure 18). The lowest level was in Côte d’Ivoire, where trainers and farmers frequently reported female participation levels as low as zero to 10 percent, which was also supported by the 2013 Survey where 11.2 percent of the participants were women (Figure 18) However, in eastern Côte d’Ivoire, the Akan culture allows women to inherit cocoa farms; participation there was closer to 30 percent, in line with the findings within the same culture in neighboring Ghana.

Qualitative research suggested several obstacles to increasing women’s participation in CLP I trainings. A frequent concern raised both by farmers and technical partners was that the timing of training sessions was problematic for women, who are often responsible for household duties that conflict with training times. Another concern was that FFS and FBS trainings may have intentionally or unintentionally targeted landowners, who are disproportionately men. For example, in group interviews with farmers in Côte d’Ivoire, farmers rarely reported not owning their land. This may be in part because recruitment for trainings was organized through cooperatives whose members are most often the farm owners. However, the evaluation team noted that in some areas of Ghana and Nigeria, trainers had encouraged women who do not own land to participate in trainings. Technical partners in Côte d’Ivoire and Nigeria also noted that in some Muslim

communities, women are not allowed to be in the same room with men, which severely limited access in these communities.

Figure 18: Gender Distribution Among Farmers Trained

		Cameroon	CDI	Ghana	Nigeria
FFS	Female	15%	11.2%	39.5%	14.8%
	Male	85%	88.8%	60.5%	85.2%
FBS	Female	14.8%	14.9%	44%	13.4%
	Male	85.2%	85.1%	56%	86.6%

The evaluation team noted several elements of CLP I activities that were intended to increase female participation. In Côte d'Ivoire, ANADER managers frequently cited Video Viewing Club (VVC) as an alternative implementation of the GAP training that was more accessible to women. These trainings were shorter and scheduled in the evening when women might be more available. This was supported by the 2013 Household Survey where the percentage of women participating in the VVC was higher than those participating in FBS and FFS women, except for Côte d'Ivoire. However, Ghana was the only country where the distribution of gender was closer to being equal (Figure 19). This finding could be related to the variation on the VVC program in Ghana was the Digital Green pilot, which was a video training program, which used short dramas to demonstrate important practices rather than duplicating the FFS/GAP training cycle. Only one of the farmer groups participating in Digital Green pilot was interviewed for this evaluation. Farmers in this group reported that the videos were helpful to reinforce messages, but did not see it as a replacement for GAP training. However, one extension agent reported that women were typically the most engaged during the debriefing session that followed the video viewing, asking questions and participating in the discussion. This suggested that video training may provide women with access to valuable outreach when they are unable to attend the complete FFS training cycle.

Figure 19: Gender Distribution Among Farmers Participating in Video Viewing Club

	Cameroon	CDI	Ghana	Nigeria
Female	25%	7.8%	42.5%	20.5%
Male	75%	92.2%	57.5%	79.5%

FFS and FBS trainers' commitment to recruiting women to their groups appeared to be another important factor to increasing female training participation. Trainers in Nigeria frequently reported that they were making an effort to include women, even in communities where this is a cultural taboo. They reported mixed results. In some cases, trainers were able to recruit significant numbers of women, but in other cases they faced resistance from the community. Women also reported that they were encouraged to join training groups by talking to other women who had already received training. Extension agents in Ghana also noted that female trainers are usually able to attract more women to participate. In the Fusmo district of Ghana, the current district extension agent (who manages the community extension agents) reported that she was able to increase female participation and work closely with men who were hesitant about their wives joining the trainings. However, the large majority of trainers were men in Ghana, and in the other three countries, the evaluation team did not meet with any female trainers. There appeared to be some resistance to increasing the numbers

of female trainers. One supervisor in Ghana argued that being an extension agent is not a job for women because of the physical demands.

Access to Credit

Qualitative research provided preliminary evidence that women face obstacles to receiving credit for inputs. In a group interview, female farmers in Côte d'Ivoire reported that they had trouble getting loans, arguing that male applicants are given preference for loans. A manager for TechnoServe confirmed this, saying that outside of the TechnoServe program, women face particular difficulties getting loans for inputs. As suggested in the KIT study, one possible explanation for this disparity in access to credit is that women farmers normally aren't land owners, so they don't have collateral for a loan.

Figure 20: Gender Distribution of Farmers Purchasing Inputs on Credit in the Past 12 Months

COUNTRY	Fertilizer		Herbicide		Pesticide	
	Male	Female	Male	Female	Male	Female
CAMEROON						
Proportion Yes	100%	0%	86.7%	13.3%	88.1%	11.9%
CDI						
Proportion Yes	88.5%	11.5%	89.1%	10.9%	88.7%	11.3%
GHANA						
Proportion Yes	54.3%	45.7%	54.6%	45.4%	58%	42%
NIGERIA						
Proportion Yes	82.6%	17.4%	81%	19%	83.6%	16.4%

In Ghana, 25 percent of TechnoServe's borrowers were women.²⁶ However, overall Ghana had higher percentages of women purchasing inputs on credit than the other three countries (Figure 20). However, Ghana also had a higher percentage of women in the trainings which would have increased access to credit. Overall the women's complaints mirrored those of the male farmers who received this credit package, women borrowers in Ghana said interest rates were too high. Several reported that they took out a loan, but were not planning on doing so again the next year because of the interest rates.

Participation in Farmer Organizations

According to WCF's reporting, female participation in farmer organizations supported by CLP was generally low. They report that women account for 11 percent of the overall farmer organization membership in Côte d'Ivoire, Cameroon and Nigeria. Côte d'Ivoire has the lowest female participation rate at 7 percent. In Nigeria, 23 percent of the six cooperatives that SOCODEVI was working with are women, an increase from the baseline's 18 percent. Overall, the membership for women increased by 139 percent between 2010 and 2013. Nigeria had the largest increase of 244 percent (Figure 21).

²⁶ TechnoServe Semi-Annual Report for CLP I Project, August, 2013

**Figure 21: Female Membership for FOs Support By
SOCODEVI**

	Cameroon	CDI	Nigeria	Total
2010	111	412	287	810
2013	186	759	989	1,934
% Change	67%	84%	244%	139%

In visits to farmer organizations in these three countries, the evaluation team confirmed that men typically dominate both the membership and leadership of farmer organizations. However, in all countries, the evaluation frequently found that women held the role of treasurer in FOs. The evaluation team also visited a small number of farmer organizations where women played an unusually large role in the leadership or membership of the organization, and these tended to be among the most effective FOs observed. In Côte d'Ivoire, one cooperative (CADI) had several women on the board of directors, including the treasurer, and a separate section of women were widely reported to be among the group's most active members. While it is not possible to determine the impact of the greater inclusion of women in this FO, several implementing and technical partners cited this FO as one of the most effective supported by CLP I. In Cameroon, the evaluation team visited one FO that had a woman as president of the board of directors. This FO was also cited by industry and technical partners as one of the most effective in the country, and it was the only FO visited by the evaluation team that had successfully been certified. FOs that included more female members often had activities that supported food crop production in addition to cocoa.

Conclusions

The combined qualitative and quantitative findings of this evaluation suggest that CLP I interventions provide services that can help farmers improve their cocoa production, join an effective farmer organization and diversify their farms. However, the quantitative data did not provide conclusive proof that there has yet been a significant average increase in yields or income that can be attributed to CLP I activities. This may be simply because of large short-term fluctuations in yields, which obscured a real effect. Qualitative research also provided evidence to suggest that the CLP I interventions have laid the groundwork for future gains in yields and income when farmers fully implement good practices and begin to increase their use of inputs, but these effects are not clear in the data yet. This section considers each of CLP's three objectives separately, analyzing the strengths and weakness of CLP's approach to each objective based on the findings of the eight evaluation questions.

Objective 1: Improve Market Efficiency

CLP I's primary approach to increasing market efficiency was more intensive than the core trainings in productivity and farm management. While FFS and FBS training reached nearly 200,000 farmers, SOCODEVI reports that cooperative trainings reached 18,142 farmers who were members of the 36 cooperatives supported in Cameroon, Côte d'Ivoire, and Nigeria. The smaller reach of this component compared to productivity training is clearly a result of SOCODEVI's approach, which involved assigning trainers to work closely with a small number of farmer organizations for the duration of the project. Qualitative research for this evaluation suggested that this was an appropriate method to tackle the problems facing farmer organizations. Interviewees in farmer groups and their management frequently cited mismanagement and lack of trust as major problems facing farmer organizations, requiring close work with the cooperatives. Given these long-term problems, it appears that an intensive approach may be necessary to build strong, sustainable farmer organizations. In Cameroon and Nigeria, where beneficiary organizations were starting from a low level of development, SOCODEVI's interventions appear to have had an important impact increasing membership and volume sold through cooperatives. However, it is important to note that SOCODEVI's reporting does not compare their beneficiary farmer organizations to others that were not supported by the program, so it is not possible to determine exactly how much of this improvement can be attributed to CLP I interventions.

Comparing SOCODEVI's data on membership growth in the targeted cooperatives with the overall trends in these three countries found in the 2013 household survey, we find preliminary evidence that CLP I activities may have contributed to growth in membership in Côte d'Ivoire, Ghana, and Nigeria, and that they helped individual cooperatives grow in Cameroon, while the overall trend was for membership to decrease over this time period. Overall in all target countries except Cameroon, there was a trend for increased membership in farmer organizations for all the surveyed farmers. Nigeria and Ghana had the smallest proportion of farmers who belonged to a farmer organization at the baseline—16.9 percent in both countries—but those figures increased to 33 percent and 31 percent in the 2013 household survey. Côte d'Ivoire also increased—from 20 percent to 30 percent—and Cameroon was the only country that showed an overall decrease in membership of the surveyed farmers over the life of the project, from 35 percent to 28 percent. According to SOCODEVI's data, membership in the six cooperatives they supported in Nigeria increased by 183% and 44% in the 33 cooperatives they supported in Côte d'Ivoire. By contrast, even in Cameroon, where overall membership declined, SOCODEVI reported an 80% increase in membership in the cooperatives they supported.

While SOCODEVI's approach to strengthening cooperatives appeared to be appropriate, qualitative evidence gathered for this evaluation raised questions about the broader strategy of supporting farmer organizations. A large majority of the farmer organizations supported by CLP I were in Côte d'Ivoire, where farmer organizations were already much stronger than in the other countries. Because of that position, it is not surprising to find that Côte d'Ivoire membership gains were much smaller than the other countries. Likewise, interviews with industry partners revealed that exporters in Côte d'Ivoire devote significant resources to supporting cooperatives, both through their sustainability and corporate social responsibility (CSR) programs, which are increasingly focused on helping farmer organizations get certified, and by providing credit to cooperatives to collect cocoa and sell to the exporter. By contrast, cooperatives in Cameroon appeared to be so weak that they had trouble initiating these relationships with exporters. By far the most common complaint of farmers in Cameroon was that they were not able to effectively sell directly to exporters so they were at the mercy of itinerant traders. In this context, with cooperatives still weak and exporters not yet embracing the merits of investing in cooperatives, it appears that CLP I has added value by helping accelerate the creation of a system like the one in Côte d'Ivoire.

A related question raised through this evaluation is whether strengthening existing farmer organizations is the most effective approach to improving market efficiency on a national scale. Among farmers in the 2013 household survey, membership in a cooperative ranged from 28.2 percent in Cameroon to 32.8 percent in Nigeria, meaning that a large majority of farmers are not members of cooperatives. While strengthening existing cooperatives may attract new members to those organizations, this may be an intensive intervention for a relatively small effect on the number of farmers who join a cooperative on a national scale. In this respect, the intervention in Ghana may provide an alternative model. In Ghana, the approach of using FFS/FBS groups as the basis for new informal and eventually formal farmer organizations means that the outreach of this program is equivalent to that of FFS/FBS training. According to the 2013 household survey, overall membership in farmer organizations increased from 16.9 percent in 2010 to 30.7 percent in 2013 in Ghana. This increase closely parallels the increase in Nigeria from 16.9 percent to 32.8 percent increase, so it is not possible on the basis of this evidence to determine whether the strategies of forming new farmer organizations or strengthening existing organizations is more effective in increasing overall membership in a country.

Objective 2: Improve Production Efficiency

The CLP I proposal said the program intended to increase cocoa yields through two avenues: providing training in good agricultural practices and creating credit mechanisms to help farmers buy inputs on loan. The overall impact of CLP I trainings in good agricultural practices and farm management on yields was not clear.

Analysis of the data from the 2013 household survey did not show a consistent, statistically significant relationship between receiving either FFS or FBS training and increasing yields. This may be because of the problems of measurement error and wide short-term fluctuation in yields noted under the findings for evaluation question one. A notable finding from the household survey was that there was very wide variation in the change in yields that individual farmers reported in baseline and 2013 survey. The median change in reported yields was within -100 and 100 kg/ha in all countries, but many farmers reported much larger changes. In Ghana, for example, while the median change in yields for all farmers was -31.69 kg/ha, 25 percent of farmers reported a decrease of 196.87 kg/ha or greater and 25 percent reported an increase of 83.48 kg/ha or greater. The variation was the greatest in Nigeria where the median change was an increase of 58.98 kg/ha, but 25% of farmers reported an increase of 498.67 kg/ha or greater, and 25% of farmers reported a decrease of 214.45 kg/ha or greater. Data on the other countries is summarized in the findings under evaluation question one. The wide variation in reported change in yields is somewhat surprising since we might have expected farmers in a given country to experience a similar trend from year to year if they face similar climatic conditions. It was unclear from the 2013 household survey whether this variation reflected a phenomenon of wide variation in farmers' fortunes in this time frame, and how much of the variation is due to measurement error due to farmers' faulty recall of the volume of cocoa they produced and their farm sizes.

While the overall impact of CLP interventions on yields was not conclusive in the analysis of the household survey, key informant interviews and group interviews with farmers suggested that, at least for the most engaged participants in these interventions, farmers could realize significant gains in yields by improving their farming practices. Qualitative and quantitative data provided evidence of how FFS and FBS trainings may have impacted yields. An important finding coming out of both the qualitative and quantitative research was that a successful outcome to the training was most often for a farmer to employ a particular farming practice better, not to adopt a new practice that she did not use before. This is reflected in the quantitative data from our survey—showing that large majorities of farmers report using important practices such as pruning, weeding, or removing diseased pods both before and after training—and qualitative research from farmers and trainers who reported that after trainings, successful students performed key practices better: weeding more often, pruning correctly, harvesting more regularly.

Since many farmers reported applying the practices taught by FFS before the training, an important question is why they were applying practices incorrectly before the training. Qualitative research suggested that this could be partly due to farmers' incomplete knowledge of the correct practice. For example, farmers particularly in Nigeria and Cameroon reported in group interviews that they had learned in FFS training how to use pesticides and fungicides at the correct times at the correct quantities and learned how to verify the quality of the product they are using. Thus, while farmers already reported using these products before training, the qualitative research suggests that they may have benefited from lessons about the correct dosages and timing of application. In contrast, farmers' comments on pruning suggested that they may hold beliefs that are at odds with the best practices proscribed in the training. A common theme among FFS trainers was that many farmers initially resisted the advice they give on pruning, because it is counterintuitive that removing branches could result in higher final yields. Several trainers explained that farmers often didn't change their pruning practices until after they saw the difference in yields at the end of the season. There were similar findings about use of fertilizers, where many farmers, particularly in Nigeria, did not believe that fertilizers were necessary — a belief contrary to the standard advice in FFS training that fertilizer can significantly increase yields.

It appears that FFS training was based on a model that would accomplish both of these goals: transferring knowledge and changing beliefs and behavior. Indeed, farmers, trainers and CLP managers often said that the most valuable part of the FFS approach was the comparison plot between the “peasant practices” plot and the GAP plot, which allowed farmers to see the difference in yield by correctly maintaining their fields. Similarly, in areas that appeared to have a successful implementation, both farmers and trainers reported that FFS training was interactive. This allowed farmers to actively diagnose and correct trees under the guidance of the

instructor, a methodology that guides farmers' behavior rather than simply transferring knowledge. It appears that one of the most important impacts of the program may have been convincing national extension agencies to fully adopt this approach to behavior change as their mainstream training method. Managers in Côte d'Ivoire said that they are replacing their demonstration plot method with a farmer field school approach.

However, there was evidence that CLP I faced a tension between maintaining the focus on behavior change and reaching the targeted number of beneficiaries. With the decision to reduce FFS training to six months, it appears that several important elements of the behavior change system may have been compromised. Notably, the trainings were no longer aligned with the agricultural season, so not all practices could be demonstrated during a given six-month cycle. This also meant that farmers might not see the final harvest at the end of the year to see the final comparison. Similarly, it appears that, in addition to the shift to a shorter training cycle, there were also fewer resources available to trainers in some countries, which hindered trainers' ability to follow up with farmers.

A third hypothesis for why farmers do not correctly apply best farming practices is that the practices require investments of time and money that they choose not to make. This hypothesis fits best for time-intensive tasks such as weeding, removing diseased pods and harvesting regularly. According to the cocoa manual produced by the Cocoa Research Institute of Ghana, weeding should be done two to four times per year (depending on the age of the cocoa trees) and requires 12 days of labor per hectare. For a 2 hectare plot, this means 48 to 96 days of labor per year, a significant investment of time. Farmers who believe this would result in only a marginal increase of yields might decide to spend this time elsewhere. Major increases in yields for those farmers who completed FFS training could be partly attributable to a lack of investment before, as in the case of a farmer who reported that his plantation was "in complete disorder" before the training.

The second approach of relaxing credit constraints so farmers can access fertilizers was still in its pilot phase during CLP I. Like its interventions in improving market efficiency, CLP's interventions to improve access to inputs were more limited in scope than their productivity training. TechnoServe reported that they delivered inputs on credit to 5,322 farmers in Ghana and 4,569 in Côte d'Ivoire through their credit program. Data from the 2013 household survey could not be used to analyze the impact of TechnoServe's credit input schemes in Côte d'Ivoire and Ghana, because the sample sizes were too small, but TechnoServe's reporting provides preliminary evidence that, by providing improved access to pesticides and fertilizers along with integrated training on their use, their interventions may have a more robust effect on yields. It is too soon to say how effective this intervention could be when scaled up to reach a broader audience, but it appears that there is a healthy demand for greater use of inputs among farmers. A common complaint by interviewed farmers who completed FFS training was that they learned how to use fertilizers, but didn't have the resources to purchase these inputs.

The evidence from this evaluation also suggested that gains in production are dependent on both good practices and proper use of inputs. In Ghana, where government programs appear to have successfully promoted the use of hybrid varieties and fertilizers before the program started, the baseline report showed that yields were still quite low. Given these findings, an alternate hypothesis is that addressing the constraints of soil quality and tree age is interdependent with good farming practices: good practices won't lead to higher yields without addressing soil quality and tree age constraints, while use of fertilizers and hybrids likely won't increase yields unless farmers use good practices.

Objective 3: Farmers Improve Their Competitiveness on Diversified Cocoa Farms

The impact of CLP I activities on farmers' diversification was the least conclusive in this evaluation. Data from the 2013 household survey showed that in all four countries, farmers increased the proportion of their income from other crops and nonagricultural income as compared with cocoa income. However, this may have been partly attributable to the decrease in cocoa prices over the course of this project. Regression analysis of the

household data did not reveal a consistent, statistically significant pattern of increased diversification as a result of CLP I trainings. However, like the evaluation team's findings on yields, this does not constitute proof that this effect did not occur, and group interviews with farmers provided preliminary evidence that FBS and FFS training may have prompted farmers to diversify. Both the qualitative and quantitative findings in all countries, however, suggest that diversification was an important strategy for farmers before FFS and FBS training, so it is difficult to attribute changes to CLP interventions. Furthermore, interviews with key informants as well as farmers confirmed that the price of cocoa does affect farmers' decisions, and since cocoa prices have declined since the start of the program, some of the shift away from cocoa may represent farmers' decisions to invest in other crops or economic activities as a result of declining cocoa prices. Significant increases in the proportion of nonagricultural income could also be related to the often-stated view that youth are unwilling to work in cocoa and are increasingly moving to the cities to seek work.

Recommendations

Drawing on the findings and conclusions of this evaluation, there are several key recommendations for the design and implementation of the second phase of CLP. While these recommendations are designed for WCF to implement, they may be useful for related interventions:

Short-term recommendations:

1. Align FFS training cycle with cocoa growing season to the extent possible
 - a. With the shortened FFS cycle, it may not be possible for the training to take place during all stages of the growing season, but CLP II should consider the optimal timing for each of the two cycles to include as much practical experience as possible.
2. Adapt training curriculum based on local needs
 - a. FFS, in the Southwest region of Cameroon, high rainfall makes it impossible for farmers to dry their cocoa in the sun as recommended by FFS training. Farmers reported losing a significant part of their income because improperly dried cocoa was rejected. FFS training should be adapted for this problem, and CLP II should look for solutions to this problem.
 - b. FFS and FBS trainings should include an opportunity for farmers to provide feedback on their particular needs to training curriculum can be reassessed and updated based on local needs.
3. Recognize the increasing role of certification in cocoa farming
 - a. Certification has become an important part of the cocoa sector. Exporters, through their certification training programs, are providing services that overlap with or complement CLP's activities; by some accounts, certification trainings cover about 80 percent of FFS concepts. There is an opportunity to partner with different certification organizations, even if it's just a way to target trainings and avoid overlapping interventions.
 - b. Recognize the importance of cocoa quality as a necessary factor when considering increases in quantity. The demand for quality and certification is increasing as farmers are being linked to buyers. Quality can also increase potentials for premiums.
4. Increase women's participation in all CLP trainings and leadership roles
 - a. CLP should continue efforts to encourage women to participate in CLP interventions, including broadening eligibility requirements for FFS and FBS training to include women farmers even when they are not owners (e.g., owners' wives, as being contemplated by Saro,

Nigeria). Similarly, scheduling training later in the day will allow more women to participate, and continuing to support innovative interventions like Digital Green will increase reach to women in evenings and support spouses attending the training together when possible. Since women do much of the work on cocoa farms even though they aren't often the farm owner, training them is essential to improving cocoa farming practices. Training women directly could potentially empower them within their household if they are responsible for a particular portion of the family farm or if they can use some of the additional income. More research is necessary to determine the impacts productivity training may have on women.

- b. Look into ways to include gender equality into trainings. This could include specific modules or could be adapting the curriculum to be more gender inclusive (e.g. include drawings and references to women farmers).
- c. Examine gender roles in FO leadership, facilitation and lead farmer roles and find ways to encourage greater female participation in these positions (short to medium term recommendation).

Medium-term recommendations:

5. Design future studies to examine gender dynamics within cocoa growing households
 - c. All household surveys completed for CLP I to date used the household as the unit of analysis. However, as discussed under evaluation question eight, prior studies of gender in cocoa farming and qualitative research for this evaluation suggested that many women within cocoa-farming households are very active in the production of cocoa. In order to understand these dynamics, a future study could be completed—either connected to an overall household survey or completed as a standalone gender study—in which researchers interview both farm managers and other members of their household. By looking within a household, a survey could gather data on several key issues including: (1) labor division within cocoa-growing households, (2) inequities in the distribution of revenue from cocoa sales within a household, (3) the impact of CLP interventions on gender inequities. This information could help WCF adapt interventions to empower women within cocoa-growing households.
6. Develop new indicators to measure the *quality* of application of good agricultural practices
 - a. CLP II should monitor farmers' adoption of practices that are implemented in the "correct" way (e.g. pruning is not necessarily effective if one branch is cut instead of the 15 that should be cut). This could be done through follow-up by trainers or extension agents.
 - b. WCF should consider running regular farm inspections rather than relying on self-reported data on application of good agricultural practices. In addition to providing a more sensitive measure of the outcome of trainings, this would provide detailed information to help improve training programs during the project. Indicators of some practices, such as weeding, could be more useful if they recorded the frequency rather than the simple question of whether a farmer uses the practice at all.

Long-term recommendations:

7. Work to improve access to inputs and planting materials
 - a. Input-credit schemes are still in early stages of development by different stakeholders (cocoa buyers, input suppliers, MFIs and, increasingly, FOs). These should be encouraged, but with close attention to the profitability of the investments, since high rates and strict loan requirements can negatively affect farmers and trap them in a perpetual loan cycle.

- b. With changing government attitudes toward fertilizer policy (notably in Ghana and Nigeria), there is an urgency for CLP to demonstrate cost-effectiveness of fertilizer use through FFS/FBS.
 - c. Integrate organic methods of soil quality maintenance (e.g., composting, proper use of shade trees) as a more prominent feature of trainings.
 - d. As demand for planting materials increases, CLP should promote community/farmer group nurseries. Seed pod distribution, as opposed to using seedlings, is an important cost-saving strategy to build improved tree stock with farmers taking responsibility for propagation. In Ghana, this can complement ACI initiatives to develop new planting reproduction technologies and government plans to substantially increase seed pod production capacity.
8. Make harmonization of cocoa sector interventions an explicit goal of CLP II
- a. CLP has successfully brought partners together and should continue to play this role, but its goals and objectives should not be lost or compromised by partners with other agendas. This was a point that was often expressed by technical partners who had the fear that working with industry partners could steer the objectives of the program away from trying to increase the livelihood of the farmers.
 - b. Consider options to combine and/or better coordinate delivery of FFS, FBS and Digital Green among technical, government and industrial partners and farmer organizations
 - c. Consider including cocoa farmer organization representatives on the CLP II steering committee, since they are best placed to assess the impact of initiatives intended to benefit farmer livelihoods.
 - d. Increase involvement of extension officers who are not focused on cocoa farming in FBS and other CLP II training, given their role in supporting the shift in CLP's emphasis to greater food security and farm income diversification.
 - e. Continue to seek new partners and innovative ways to help cocoa farmers, similar to Digital Green.
 - f. Use CLP II as a platform to encourage industry partners to share information they consider proprietary on the best approaches to increase yields.
9. Improve monitoring and evaluation system for tracking key outputs such as yield and income
- a. Collecting self-reported data on farm size and production volume creates too much measurement error and should be replaced by a system of measuring the actual weight of cocoa harvested from measured sample plots if possible.
 - b. WCF should work with government and industry partners that have existing units to measure yields, aligning these systems and using them to monitor the yields of CLP II beneficiaries. This data could also be used to provide accurate quantitative information on farm sizes, yields, income, diversification and other key outcomes.
 - c. In addition, to internal M&E systems, WCF should work to develop standardized M&E system across the cocoa value chain to be able to measure each critical point in the chain. This should be developed and implemented through partnering with key industry, implementation and government partners when possible.
 - d. If direct measurement isn't possible, future measurement of yields should include a method to validate self-reported data. This exercise might involve comparing farmer-reported farm size

with externally measured farm size to assess the degree of bias (if any in using farmer reports). If biases exist, it may be possible to generate a simple predictive model adjustment that brings farmer-reported values more in line with their true values (if required), and thus improves WCF's ability to assess impact.

- e. If key outcomes for CLP II (such as yield) are expected to be volatile (because of weather, crop disease, geopolitical instabilities, etc.), WCF should consider increasing the number of measurement occasions, while also reducing the lengths of the associated measurement intervals. With more data points, it is possible to make more fine-grained statements about the rate and types of changes, while also mitigating the possibility that a “bad cocoa year” washes out true program effects. Collecting more data is costly, yet an increased number of measurements can reduce required sample sizes. It may be possible to only collect essential data at the interim points, thus reducing interim costs in spite of the increased number of measurement occasions.
- f. Require standard reporting templates for matching grant and technical partner performance monitoring and distribute performance data to members for learning (short-term recommendation).
- g. Prioritize and find ways to use existing data that is collected for reporting and tracking of participants. For example, GIZ had binders of paper farmer registration forms with demographic baseline data that was not being used or looked at (e.g., farm size, age, family data, etc.). Another example is industry partners in Côte d'Ivoire that reported using an array of different monitoring systems, which collect data on yields and on farmers they support through their CSR/sustainability programs. With improved collaboration, there may be opportunities for improved information sharing and coordinated efforts.

Annexes

Annex A: Terms of Reference for Evaluation

Annex B: Semi-Structured Interview Guide

Annex C: Semi-Structured Interviews Completed

Annex D: Household Survey Questionnaire

Annex E: Analysis of Data from 2013 Household Survey