



Inception Report

Feed the Future for Climate-Smart Cocoa Program

[A living document]



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Acronyms

APROCACAOH	Cocoa growers' association of Honduras
BCIE	Centraamerican Bank for Economic Integration
CATIE	Tropical Agricultural Centre for Research and Teaching
CCAFS	CGIAR Research Program on Climate Change, Agriculture and Food Security
CCC	Le Conseil du Café-Cacao
CFI	Cocoa & Forests Initiative
CGIAR	CGIAR
CIAT	International Center for Tropical Agriculture
CIRAD	Centre de coopération internationale en recherche agronomique pour le Climate Change (UNFCCC)
CLP	Cocoa Livelihoods Program
CNRA	Centre National de Recherche Agronomique de Côte d'Ivoire
COCOBOD	Ghana Cocoa and Coffee Board
COP23	23rd session of the Conference of the Parties (COP 23) to the UN Convention on
CRIG	Cocoa Research Institute of Ghana
CRS	Catholic Relief Services
CSA	Climate-Smart Agriculture
CSC	Climate-Smart Cocoa
DBH	Diameter at Breast Height
ENSO	El Niño–Southern Oscillation
ERPD	REDD+ Emissions Reduction Programme Document
FAO	Food and Agriculture Organization of the United Nations
FHIA	Honduran Foundation for Agricultural Research
FI	Financial Institutions
FUNDER	Foundation for rural business development Honduras
GACSA	Global Alliance for Climate-Smart Agriculture
GAP	Good Agricultural Practices
GCFRP	Ghana Cocoa Forest REDD+ Program
GCM	Global Climate models
GHG	Greenhouse gases
HIA	Hotspot Intervention Area
ICPM	Integrated Crop and Pest Management
ICRAF	World Agroforestry Centre
ICT	Information and communication technology
IDH	Dutch Sustainable Trade Initiative
IFAD	International Fund for Agricultural Development
IITA	International Institute of Tropical Agriculture
IPM	Integrated Pest Management
ISFM	Integrated Soil Fertility Management
ISLA	Initiative for Sustainable Landscapes
ISU	Prince of Wales' International Sustainability Unit
LC	Learning Community
LWR	Lutheran World Relief
MEFCCA	Ministry of Family Economy and Cooperative Associativity, Nicaragua
MRV	Monitoring, Reporting and Validation
ONUDI	United Nations Industrial Development Organization
OSH	Occupational Safety and Health
R&R	Renovation and Rehabilitation
RA	Rainforest Alliance
RC	Root Capital
REDD+	Reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries
ROI	Return on Investment
SFL	Sustainable Food Lab
SNV	SNV World
SPU	Seed Production Unit (Cocobod)
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
UTZ	UTZ Certified
WCF	World Cocoa Foundation

Executive Summary

Inception report on Climate Smart Cocoa

Climate Smart Agriculture refers to “agriculture that sustainably increases productivity, enhances resilience and adaptation, and reduces/removes greenhouse gasses (GHG) where possible (productivity – adaptation – mitigation).” Climate-Smart Cocoa (CSC) is the application of CSA in cocoa value chains and aims to transform the cocoa sector in the face of impending climate change impacts. The Feed the Future Partnership for Climate Smart Cocoa (CSC) Program, supported by USAID and by World Cocoa Foundation (WCF) member companies, aims at increasing private sector investment and engagement to promote and support the adoption of CSA practices among smallholders in cocoa-producing landscapes. This inception report is an attempt to build a common understanding and to open a discussion on key CSA themes. This should help stakeholders of the CSC Program to develop sector-wide strategies to test and scale CSA practices in cocoa landscapes.

Impact of climate change in cocoa landscapes

The long-term impact of climate change on cocoa production in the West African cocoa belt remains uncertain, despite several studies. The current expectation is that both maximum dry season temperatures and dry season water availability will limit cocoa production. Systemic adaptation strategies will be necessary in most cases, while in some areas even shifts in cocoa cultivation may be observed. Current studies carried out by CIAT and CATIE confirm that Central America may become distinctly drier, showing higher temperatures and lower precipitation. High intensity precipitation during tropical cyclones can become a common feature during coming decades. Cocoa production in Central America may not be affected as much as West Africa, however, adaptation efforts will be necessary in all the cocoa growing regions of Central America and Caribbean.

Perception and need of the industries to address challenges of Climate Change

Studies carried out by our partners of the CSA Learning Community (LC) reveal that most companies are at the initial stages of developing strategies explicitly to address climate change adaptation. Companies are looking for more clarity from climate scientists about the extent to which current sustainability programs are already building resilience to the impacts of climate change, and on what else is needed. Leading companies have also emphasized the need for more refined quantification of the economic impacts of climate change in different cocoa producing regions, as well as projections for the companion crops that can be grown in a diversified system with cocoa, such as coffee, cashew and others.

Investment of the companies to address the challenges of climate change

Most private investments are focused on cocoa productivity by providing training, inputs and credit. Investments for adaptation which may implicate more expensive techniques like irrigation and diversification beyond cocoa are not that common. For mitigation, the discussion is focused on agroforestry and on preventing deforestation. The life cycle analyses of cocoa production and trade show that emissions from deforestation is the largest source of GHG. Corporate investments and commitments are generally not exclusively related to climate change but to multifaceted issues. However, there is a notable shift from an emphasis on certification and Good Agricultural Practices (GAP) training to the inclusion of landscape programs on deforestation, on more private-public partnerships, and on farmer professionalization.

Cocoa, forests and climate change landscapes

In West Africa, cocoa value chains are well established and quite central to the governments, particularly in Côte d'Ivoire and Ghana. In both countries, considerable policy and institutional reform processes are underway regarding the nexus between cocoa, forests and climate change. These efforts are strongly related to the work of the national REDD+ secretariats. Central America has a very small share in the world market of cocoa, but is a reliable source for fine flavor beans. The Central American Agricultural Council, a regional coordination platform of the Ministries of Agriculture from all Central American countries, have prioritized attention to the cocoa value chain where climate change adaptation is concerned.

Climate smart cocoa training curriculum

In West Africa, both COCOBOD in Ghana and the Conseil du Café-Cacao in Côte d'Ivoire use harmonized training materials to train cocoa farmers. However, the practices recommended in these curricula are the same for every farmer, irrespective of location and farmer profile. Based on extensive studies carried out by CCAFS and Rainforest Alliance, the CSC Program uses the characteristics of each zone to develop training materials with specific climate-smart advice tailored to different types of farmers. In Latin America, the CSC Program will initially review and update the Cocoa Toolkit developed by Lutheran World Relief to improve and innovate cocoa agroforestry systems and incorporate climate-smart cocoa practices. Cross-learning will happen between the Latin America and West-Africa partners on these two impact pathways.

Cocoa Agroforestry market analysis

Under the CSC Program, ACIDI/VOCA undertook a cocoa agroforestry market analysis in which it identified oil palm, cocoa, plantain and timber as priority crops for the Liberia pilot to focus on. ACIDI/VOCA then identified profitable end-market opportunities and constraints that the actors face in attaining those, and interventions to address those constraints. This analysis will guide project interventions also beyond Liberia, in Côte d'Ivoire and Ghana. More in-depth cost/benefit analyses are needed to prioritize and further select agroforestry options.

Heat and drought resistant planting materials

Heat and drought resistant planting material was determined to be a key industry priority. The CSC Program, in alliance with Bioversity International aims to focus on: (i) screening of genetic diversity with common tools, methods and standards for agreed traits; (ii) identification of tolerant materials to drought and heat while ensuring relevant regional pest and diseases resistance and good quality and flavour; (iii) testing on multi-sites – under a range of environments and agricultural practices – and monitor performance; (v) evaluations in farmers' fields; and (vi) multiplication and distribution resilient improved material to farmers' fields.

Exploring additional CSC pilot themes

The CSC Program is committed to continuously exploring additional areas and themes of interest to our companies and partner organizations. The report discusses current knowledge levels, regional differences, the direction of change and perceived threats, open questions, proposed solutions and possible opportunities for the following CSC themes: forests and deforestation; the business case for cocoa agroforestry systems; optimal shade levels; innovative finance mechanisms; land and tree tenure; creating resilience and decent living standards through additional livelihoods; youth, gender and intergenerational farming; and improving existing climate change predictions.

Way forward

Based on the ideas presented in this Inception Report, and the feedback provided by the stakeholders, National Inception Reports will be elaborated for the target countries of the CSC Program. The key cocoa sector actors in these countries will use the inputs from the global and national inception reports to engage in an iterative process to elaborate a sector-wide strategy for addressing climate change impact in cocoa, develop pilots and pursue an intensive process of collective learning. We expect that this will lead to the development of short, medium and long-term investment plans, also based on the evidence generated by the CSC pilots. We invite any stakeholder to contribute to these goals and join our learning journey.

Introduction

Cocoa is an important agricultural commodity for rural communities and for the private sector. Cocoa also is a unique crop facing a complex set of challenges, both today and in future. Currently, West Africa accounts for over 70% of global cocoa output involving an estimated two million households, most of them smallholders with three hectares or less. Central America's cocoa sector is significantly smaller, but production has been increasing rapidly. This region is of growing interest to the private sector, particularly small and medium enterprises. Both regions are facing the global challenge of climate change. Scientific modelling suggests that different cocoa cropping areas may need to change crops and cropping strategies, or adapt management practices, in order to maintain cocoa supply and viable livelihoods. This report therefore examines and the critical concept of climate-smart agriculture (CSA), in the case of cocoa.

The cocoa industry is most familiar with one key pillar of CSA — sustainably increasing agricultural productivity and smallholders' incomes. This commitment is driven by their business model and by concerns about economic and social sustainability. Climate change adaptation and mitigation are new on the radar and some new exciting initiatives exist. As climate change alters the core characteristics of agricultural landscapes, it threatens the viability of cocoa production, impacting 'people, planet and profit', thereby directly threatening all core cocoa sector interests. Significant opportunities exist to leverage and optimize industry engagement and investments in cocoa sustainability, with a view to adapt, mitigate and build resilience to climate change. Some of these opportunities are more clearly defined than others, which underlines the need for continued joint learning.

The Feed the Future Partnership for Climate Smart Cocoa (CSC) Program, supported by USAID and World Cocoa Foundation (WCF) member companies, provides us with the opportunity to work with industry, growers' organizations, development agencies and national governments, in order to develop strategies for greater cocoa industry engagement in CSA. The CSC Program also aims to identify, tests and bring to scale innovations that enable farm households and the industry to adapt to pressures from climate change without putting forests at risk.

This inception report is an attempt to build a common understanding and open up a discussion on key themes in CSA in the cocoa sector so that the stakeholders of the CSC Program can jointly develop sector-wide strategies to test and scale CSA among smallholders in cocoa-producing landscapes of the target countries. The report is a living document and builds on data, information and analysis carried out by WCF and its knowledge partners. We actively invite readers to provide us with their comments, and further contributions to the ongoing discussion.

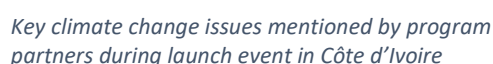
The Climate-Smart Cocoa Program

Changing climatic conditions within the agricultural landscape threaten the viability of cocoa production, economic and social sustainability, and core industry interests. Climate change models predict that farmers in cocoa-growing regions may need to change crops and cropping strategies or adapt innovative management practices to maintain cocoa supply and viable livelihoods.

To address the threats that climate change poses to the cocoa sector, the World Cocoa Foundation (WCF) is partnering with United States Agency for International Development (USAID), ACIDI/VOCA and nine WCF company partners (Barry Callebaut, Cargill, Ecom, The Hershey Company, Lindt & Sprüngli, Mars, Inc., Nestlé, Olam and Touton) on a climate-smart agriculture program: Feed the Future Partnership for Climate-Smart Cocoa. This USAID-funded Climate-Smart Cocoa (CSC) Program in West Africa and Latin America is part of a triad of Feed the Future CSA initiatives along with the 'Learning Community for Private Engagement in Climate Smart Agriculture' (LC) and the 'Alliance for Resilient Coffee'.

Expected impacts of climate change on cocoa	
-	Suitability in lowland areas
+	Suitability in higher altitudes
-	Cocoa productivity
+	Pest and disease prevalence
-	Cocoa quality
-	Number of cocoa harvests
+	Labour needed

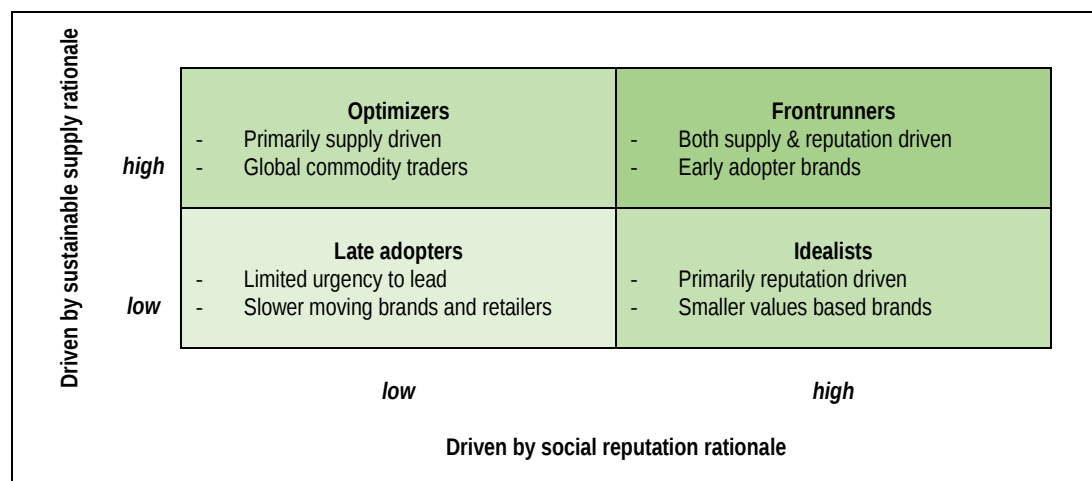
The CSC Program will enhance sustainability by building evidence-based strategies to stimulate private sector investment and engagement. Participating companies will: (i) better understand climate related risks and how these impact the sector, (ii) have a CSA strategy for the sector, (iv) have the capability to integrate CSA into their activities, and (v) be incentivized to invest in CSA in the long-term. The CSC Program runs until May 2020 with a US\$2.1M core budget and is initially focused in West Africa (Côte d'Ivoire, Ghana and Liberia) and Latin America (Dominican Republic, El Salvador, Honduras, and Nicaragua). In each of these countries, the CSC Program builds on existing public and private sector commitments in order to generate greater collaboration in strategy development, and identify and test innovations in CSA.



A typology of private sector climate change risk perception in smallholder cocoa

The CSA Learning Community has generated insights into the diverse needs of different companies in the cocoa and chocolate sector using a collaborative and systematic approach. By sharing learning across projects and platforms, the LC has begun mapping corporate priorities, major challenges and knowledge gaps. The usefulness and scale of the tools and information that can meet these needs often requires tailoring approaches to specific companies. To facilitate this process, the LC has generated a simple typology that helps to outline the underlying motivations of companies to engage and invest in climate-related actions, based primarily on the business rationale provided by the participating companies themselves. A summary is provided in Figure 1 below, while more detail, though still preliminary, is provided in Annex 2.

Figure 1. A typology of private sector climate change risk perception



Approach and organization of the report

The key aim of the CSC Program is for the private company members in the target countries to evolve together towards the public-private implementation of a shared climate-smart cocoa investment strategy. The strategy will help address the threat of climate change on farmer livelihoods and ecosystems in cocoa-growing regions, also with the aim to secure future cocoa supply. Developing a CSA strategy for the cocoa growing regions first requires an analytical foundation and understanding of the landscape of relevant activities and investments.

Building on previous experiences with several well-established public-private partnerships, this inception report provides an initial understanding of the issues, areas of interest, state of our current knowledge and potential areas, and aims to incite thinking towards concrete and systemic transformation in the sector.

In this first iteration of the CSC Program ‘inception report’—a living document—primarily aims to:

- To draw information from the work of the CCAFS/Learning Community and other sources to create an initial overview of knowledge and opportunities in climate-smart cocoa.
- To inform and facilitate initial discussions towards the development and implementation of a shared CSA strategy for the cocoa landscapes.
- To develop a ‘living’ comprehensive inception report that will form the continuous basis for strategic discussions between the public and private cocoa sector in the target countries.

This report therefore represents a synthesis and interpretation of work conducted by others, packaged in a form that is useful and actionable for the private sector, with information both on West Africa and Latin America. This first version will require several rounds of review, and more learning from pilots and other experimentation within the CSC Program, before it will eventually evolve into a strategy document to help guide engagement and investment in CSC.

Roadmap of the report

This report first briefly introduces the CSC Program and elaborates on the concepts of CSA and CSC based on current understanding and definitions. In the following section, the report draws on the work carried out by the CGIAR-CCAFS consortium to summarize the current predictions of impact of climate change on cocoa. Detailed information is provided for West Africa and preliminary results for Central America. The report then provides a global analysis of climate change risks on the cocoa value chain, including a summary of private sector commitments and activities in the climate smart cocoa landscape.

Following the global analysis, the report discusses the scope of piloting innovations for building CSA in the cocoa landscapes, both in West Africa and Latin America. It provides information and a progress reports on three pilots: 1) development of a cocoa curricula that incorporates CSA considerations; 2) the facilitation of market linkages to support development of agroforestry in West Africa; and 3) screening and breeding for drought and heat tolerant cocoa planting materials.

The report concludes with a section on a series of additional themes and potential pilot initiatives for climate smart cocoa arising from the discussions on the ground with a wide range of stakeholders in West Africa and Central America. These themes are discussed in light their potential in the different cocoa growing regions as pilots that can fuel the collective learning on innovation, local adaptation and on the scaling of CSA in cocoa growing regions.

PART I – What is Climate-Smart Cocoa?

The evidence that global temperature is rising is overwhelming (<https://www.climate-lab-book.ac.uk/spirals/>) and threatens global agricultural supply, particularly with tree crops such as cocoa that may be slower to adapt to a rapidly changing climate. CSA is not a new agricultural system or set of practices. It is a new integrated approach to jointly address climate change impacts and food security. The concept of CSA was introduced in 2010 at the FAO Global Conference on Agriculture, Food Security and Climate Change, and has since been widely used. FAO speaks of “agriculture that sustainably increases productivity, enhances resilience (adaptation), reduces/removes greenhouse gasses (GHG) (mitigation) where possible,” thereby enhancing achievement of national food security and development goals. Climate-Smart Cocoa (CSC) is the application of CSA in cocoa and aims to transform and reorient developments in the cocoa sector in the face of climate change. CSC deals with numerous synergies and trade-offs, including: maintaining ecosystem services; multiple entry points; the specificity of context; and the engagement of women, youth and marginalized groups.

Web Resources :

CSA guide:

<https://csa.guide/csa/what-is-climate-smart-agriculture>

FAO CSA Sourcebook:

www.fao.org/docrep/018/i3325e/i3325e.pdf

Six key areas as a starting point for CSC country dialogues

CSA as defined by FAO focuses on three areas: **increased productivity, adaptation and mitigation**. In the context of this program on CSA in cocoa, we understand CSC to include the ‘smart’ combination of:

1. Sustainably increasing agricultural productivity and incomes, while maintaining quality.
2. Adapting and building farmer resilience to climate change.
3. Mitigation; reducing and/or removing greenhouse gases emissions, including effective Monitoring, Reporting and Validation (MRV) and key focus on ending deforestation and forest degradation.
4. Improving food security and diversification, and
5. Promoting social and economic development.

This wider set of areas is based on creating alignment with public and private sector strategy priorities, both among Latin America and West-African stakeholders. CSA, (and therefore CSC) should at any rate be further defined within the specific context of a cocoa-producing country or region as part of a multi-stakeholder process and a public-private strategic dialogue. The CSC Program attempts to facilitate this public-private dialogue in each of the program countries (or convene it where nonexistent) through strategic or thematic working groups and connection to the REDD+ mechanisms where possible. This is expected to generate an appropriate set of CSC entry themes that need further consideration

Key aims for site-specific CSA approaches (FAO CSA Sourcebook)

- Address the complex interrelated challenges of food security, development and climate change, and identify integrated options that create synergies and benefits and reduce trade-offs.
- Recognize that these options will be shaped by specific country contexts and capacities and by the particular social, economic, and environmental situation where it will be applied.
- Assess the interactions between sectors and the needs of different involved stakeholders.
- Identify barriers to adoption, especially among farmers, and provide appropriate solutions in terms of policies, strategies, actions and incentives.
- Seek to create enabling environments through a greater alignment of policies, financial investments and institutional arrangements.
- Strive to achieve multiple objectives with the understanding that priorities need to be set and collective decisions made on different benefits and trade-offs.
- Prioritize the strengthening of livelihoods, especially those of smallholders, by improving access to services, knowledge, resources (including genetic resources), financial products and markets.
- Address adaptation and build resilience to shocks, especially those related to climate change, as the magnitude of the impacts of climate change has major implications for agricultural and rural development.
- Consider climate change mitigation as a potential secondary co-benefit, especially in low-income, agricultural-based populations.
- Identify opportunities to access climate-related financing and integrate it with traditional sources of agricultural investment finance.

within that country (or regional cocoa landscapes) regarding the development of pathways for increased sector engagement and investment.

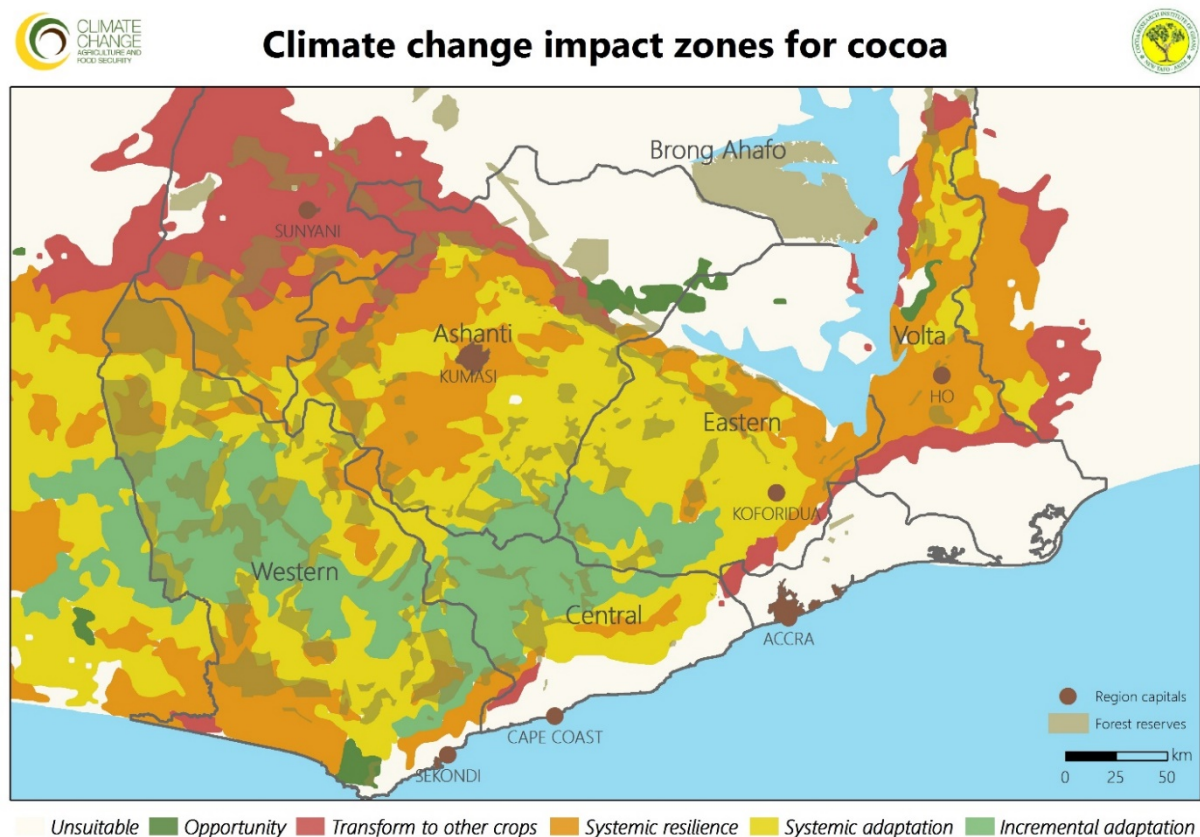
Current predictions of impact of climate change on cocoa

The West African cocoa belt covers roughly the extent of the former Upper Guinean Rainforest, from Sierra Leone to Cameroon. The long-term impact of climate change on cocoa production in this area remains uncertain despite several studies by CIAT. The current expectation is that both maximum dry season temperatures and dry season water availability will limit cocoa production. Systemic adaptation strategies (applying multiple lenses to adaptation of smallholder farming systems, including social, institutional, economic, political, agronomic and environmental perspectives) will be necessary in most cases, while in some areas even shifts in cocoa cultivation may be observed. Little research on predicted climate impacts is available on regions beyond the West African cocoa belt, and even where such studies exist the challenges to adaptation are rarely comparable and differ widely between the cocoa growing regions.

In collaboration with the national cocoa research institutes in the Centre National de Recherche Agronomique de Côte d'Ivoire (National Agriculture Research Center of Côte d'Ivoire) (CNRA) and Cocoa Research Institute of Ghana (CRIG), the CCAFS/LC produced impact assessments to compare the distribution of cocoa production with historic climate conditions and to draw from climate variables that are physiologically meaningful for cocoa production. The models used 'machine learning algorithms', advanced software models that learn from the historic climatic distribution and apply this to simulated future climate data. This approach artificially learned under which climate conditions cocoa is produced today and asks where such climate conditions might be found in the future.

Figure 2 shows the gradient of impacts for Ghana as was developed by CIAT with CRIG. These national suitability maps are an input to a site-specific, strategic response to climate risk. For example, the Ghana maps are being utilized to develop suites of CSA practices to respond to different kinds of climatic threats.

Figure 2 Distribution of climate change impact zones (2050s-RCP6.0) and dominant adaptation typology in Ghana.



Five fundamental types of strategies were identified, across three categories:

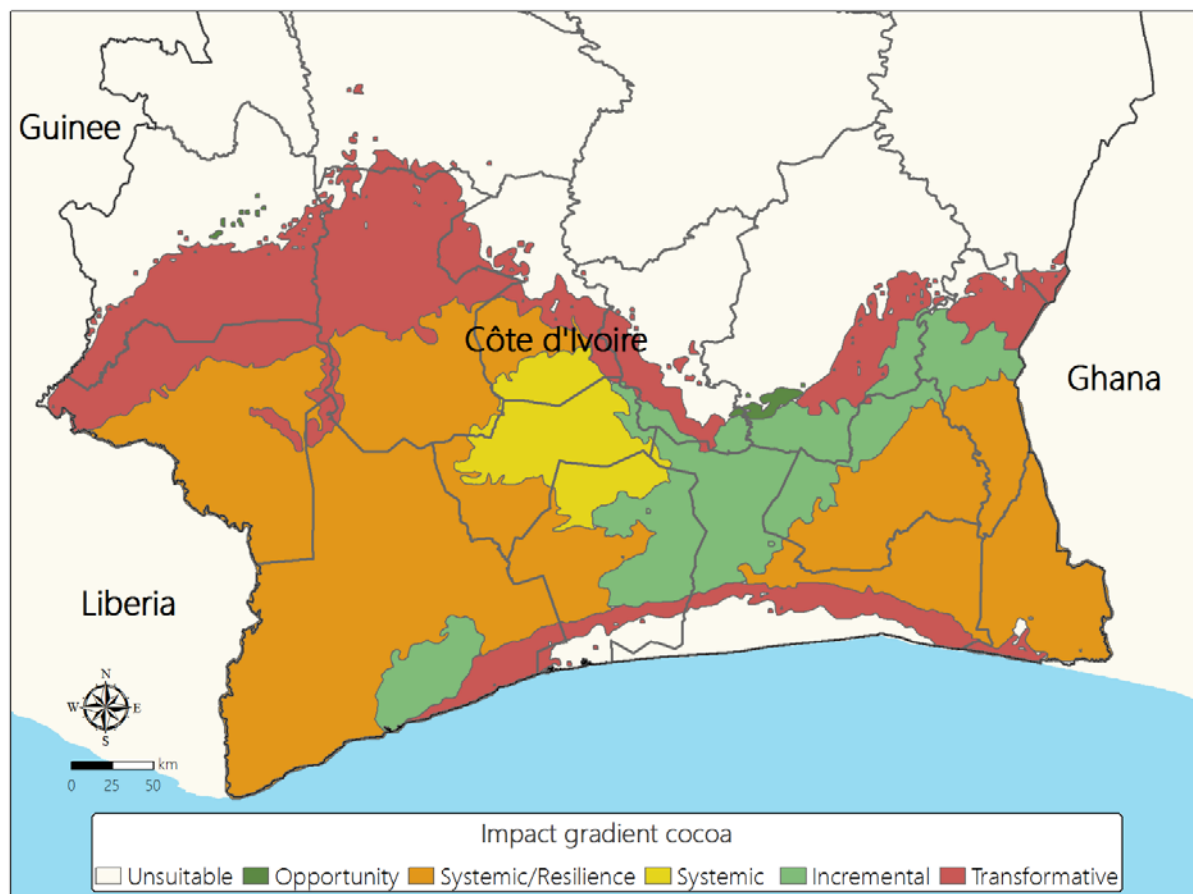
COPING ZONES (green): These two categories, “opportunity” and “incremental changes,” will become or remain suitable for cocoa production, even under a ‘business as usual’ scenario. The climate will not fundamentally become limiting, though incremental changes to agronomic practices are still advised—keeping in mind that with climate change also comes increased climate variability. The focus is less on any specific climate hazard as a main strategy but more broadly on setting up and promoting best management practices that enhance system resilience and sustainability overall.

ADAPTATION (yellow and orange): These two categories show either a high certainty of change (specific hazards/threats that have been identified that require systemic adaptation of the cocoa farming system to ensure productivity), or high uncertainty of remaining suitability (unclear climate hazards that call for maximum adaptation to raise the overall resilience to climate change of the farming system). The focus under the former (yellow) would be on adaptation strategies that address higher annual average temperatures, weak dry season (short, with comparatively higher precipitation in the driest quarter) and overall higher annual precipitation. Within the latter (orange), the focus is on implementing and promoting best management practices—similar to the coping zone—but emphasizing especially those practices that build stronger agricultural systems and sustainability overall. Priority is on so called ‘no-regret solutions’ such as shade enhancement or diversification with suitable tree species that are known to have a multitude of benefits and protect against a series of possible threats.

TRANSFORMATION (red): Areas in this category were found to become unsuitable for cocoa production in the future. Production in these zones will likely become unviable or transitioning to alternative crops appears to be more efficient than extensive adaptation efforts. In the case of Ghana and cocoa this could for example be through diversifying cocoa shade systems with more suited and drought tolerant tree species that would allow for cocoa to be phased out completely over the long term. In the short term, drip irrigation could support immediate adaptation of the current production system whilst preparing for a transition into a suitable alternative. Another solution might be for areas of cocoa that are in need of replanting be replaced by other cash crops such as shea and cashew or food crops.

A similar study has been conducted for Côte d’Ivoire (Figure 2), where climate change is predicted to threaten the viability of cocoa production towards the Southern and Northern margins of the cocoa belt there. The central cocoa zone will be least affected with only incremental adaptation requirements. Towards the west and the border with Liberia and towards the east and the border with Ghana systemic changes will be necessary to keep cocoa production viable. In most of the cocoa zone projected climate change impacts were highly uncertain because of disagreement between global climate models. These regions will require an adaptation strategy that aims at increasing the overall resilience of the system similar to what is being outlined above under systemic resilience for Ghana.

Figure 3 Distribution of climate change impact zones (2050s-RCP6.0) and dominant adaptation typology in Ivory Coast



Note that, due to differences in methods and modelling approach and the previously mentioned uncertainty of the predictions, the Côte d'Ivoire and Ghana maps cannot be overlapped nor joined together.

Central America is highly exposed to climate change and strongly affected by droughts, hurricanes and the El Niño-southern oscillation (ENSO) phenomena. In 2012, CIAT elaborated the first report on impact of climate change for cocoa producing zones of Nicaragua. According to historical climate data, these areas had a temperature range of 18-24°C and average annual rainfall between 1400-5000 mm. Projections of 19 Global Climate Models (GCM), indicated an increase in temperature and a reduction of precipitation. However, an adjusted model of crop yield based on the GCM predictions indicated positive change in climatic fitness for cocoa. Current studies carried out by CIAT and CATIE (2016-17) confirm that in the future Central America may become distinctly drier, showing higher temperatures and lower precipitation. On the other hand, high intensity precipitation during tropical cyclones can become a common feature during coming decades. These preliminary assessments of climate change impact on cocoa production carried out by CIAT suggest that cocoa production in Central America would not be affected as much as elsewhere, however, adaptation efforts will be necessary in all the cocoa growing regions of Central America and Caribbean. A new report by CIAT on climate exposure of the cocoa growing regions of Mesoamerica will be available in the second half of 2017.

How climate-proof are cocoa value chains?

In 2016, SFL and CIAT held interviews with leading cocoa and chocolate companies to understand their investments in climate resilience and their priorities for the research community to help them respond to climate risk for smallholder cocoa farmers. Most companies are already tracking the impact of climate change on their security of supply and interested to learn more about the range of options to strengthen farmers and suppliers' ability to adapt to a changing climate. Industry recognizes the immediate and long-term threat of climate change to farmer livelihoods and a stable cocoa supply. Without exception, the companies interviewed expressed interest and willingness to learn and to help

farmers respond to climate change. There was also a common request for tools that can help both farmers and buyers understand the extent, nature and timescale of the risk.

Interviews that the CSC Program conducted in 2016/2017 with producer organizations and cocoa industry actors in the Dominican Republic, Honduras and Nicaragua showed that production and exportation of fine aroma cocoa was affected by prolonged drought (2014-2016) and excess high intensity rainfall during flowering (2016/17) induced by the ENSO. The reductions experienced in the recent past were significant enough to affect the business targets both in terms of volume and quality and have created a deep impression on the actors about the importance of sustainability of the cocoa value chain in the face of climate change and extreme natural events.

Climate risk in context

Over the last decade, the cocoa and chocolate industry has deepened its knowledge of the complex challenges facing cocoa farmers and greater cocoa sustainability and has adopted investment programs to respond to these challenges. Several companies interviewed referenced the framework of CocoaAction, for example, which brings together investments in productivity with those to strengthen and empower rural communities. Most also cite the threat that deforestation presents to both farm and landscape level resilience and the need for proactive efforts to preserve standing forests and renovate degraded land. Industry leaders view climate risk and resilience as one of several challenges that must be integrated with programs that address low productivity, aging cocoa trees, child labor and limited access to credit, inputs and improved planting material as well as lack of social services like education and health care. Climate change is not a separate issue and the response should not be a separate solution.

Most companies are at the initial stages of developing strategies explicitly to address climate adaptation. Multinational companies generally have climate commitments or policies, but tend to be focused on GHG emissions in their facilities, energy use and operations – those factors under the company's direct control. See Annex 1 for a table of commitments. Companies are looking for more clarity from climate scientists about the extent to which current sustainability programs are already building resilience to the impacts of climate change and what else is needed. The term “climate-smart agriculture” is considered vague within the industry and there is universal interest in having clear criteria for defining what is and what is not “climate-smart”. This is not unique to the cocoa industry. Leaders interviewed in other sectors repeatedly mentioned that the core principles of sustainable agriculture are intended to build healthy soils and productivity and reduce environmental damage of agriculture. Industry leaders across the board recognize the risk of climate change to supply security.

“The apparent climate ‘abnormalities’ are becoming the new normal and the industry will have to change in order to cope. [Climate change] is a threat to supply, there will be no cocoa left to trade at this rate.”

-Leading cocoa trading company

Analysis needed for companies to improve or develop a climate strategy

Companies need a clear definition of ‘climate smart cocoa’, need decisions on metrics and monitoring & evaluation, and need assessments of the extent and nature of climate risk for their sourcing regions and supply chains. Initiatives like the FAO's Global Alliance for CSA (GACSA) is helpful, but more is needed. Risk management is done in all companies as a core commercial function and most have added climate change as one factor in assessing the probability of supply disruptions. The extent of risk can increase proportionally to a company's dependence on one supply region and/or to the extent of ‘sunk resources’ in a place, such as processing facilities. As the world's largest producing region, the priority for the mainstream cocoa and chocolate industry is risk to supply from West Africa. A few companies also mentioned their interest in secondary origins such as Indonesia, and South America, notably Brazil, Ecuador and Peru.

In addition to maps of projected impacts, leading companies have emphasized the need for more refined quantification of the economic impacts of climate change in different cocoa producing regions, as well as projections for the companion crops that can be grown in a diversified system with cocoa, such as coffee, cashew and others. The CCAFS/LC has collected the first tranche of data from the Ghana Cocoa Board (COCOBOD) and is calculating the costs of inaction to answer this question. IITA

is currently seeking similar data for Ivoirian production to enable a comparable quantification for Côte d'Ivoire.

Assessing climate smartness of current corporate programs

Climate smart agriculture has three key pillars: productivity, adaptation and mitigation. To evaluate the “climate smartness” of any company program, we need to consider each of these variables. Having said that, and to repeat from an earlier section of this report, focusing on climate smartness in cocoa without also looking at raising income, ending deforestation, improving food security and socio-economic development would be useless. Below, the three key pillars are assessed against corporate programs.

Pillar 1 – Productivity

Most private investments in cocoa sustainability in West Africa are focused on the first pillar: productivity. Providing training, inputs and credit for increased productivity of cocoa per hectare has been at the heart of the industry's approach to ensuring profitability for farmers and securing supply of cocoa to meet growing demand. Every company interviewed has a program related to this pillar, some of which are proprietary company led programs such as Ecom's technical assistance program, the Hershey Company's Source Trust or Cargill's Cocoa Promise program which report significant yield improvements. Other programs are delivered as part of public-private initiatives such as the WCF-led Cocoa Livelihoods Program (CLP).

Several industry leaders invest in the long-term improvement of planting material. Mars and Nestlé, for example, both support breeding programs in Asia, Africa and Latin America to develop varieties with higher resistance to pests, diseases and climate variability along with higher productivity and quality.

The gap in productivity programs is in the scope and reach, and ability to address structural barriers to sustainable productivity. Companies admit that current programs are not touching every farmer, nor do they aim to, and it is particularly challenging to reach farmers not organized in a marketing organization like a farmer cooperative. The transaction costs of delivering services and inputs to the smaller and more remote farms prevent programs, even those aiming to be as inclusive as possible done in collaboration with government agencies and civil society organizations, from reaching all farmers. Structural issues such as aging farmers and old trees, small farm size, illiteracy, cultural barriers and lack of trust all limit the impact of productivity-focus interventions. The recent price drop has furthered complicated efforts to bring value to farmers through increased productivity. Efforts like The Hershey Company's CocoaLink digital training program done in collaboration with COCOBOD can reach a large number of farmers but are limited by low literacy and smartphone penetration in rural areas.

Pillar 2 – Adaptation

Adaptation includes both the ability to absorb a shock and to respond to changing conditions. Adapting requires an individual or community to have the capacity to both understand and develop responses to the impacts of climate change. Corporate sustainability programs usually include information and training on best agricultural practices as well as strengthening community level institutions, which can be important sources of information and services. Several companies interviewed cited the challenge of sourcing reliable and relevant weather data in cocoa growing regions. Farmers are aware of the climatic shifts such as stronger Harmattan winds and longer dry seasons in the northern cocoa growing regions of West Africa, for example, but do not have access to consistent and reliable projections of the next season's climate. General sustainability efforts to build business and knowledge centers at the village level, such as the Lindt initiative (that has built 25 such village resource centers or a similar program of Touton's to build service centers), are also establishing spaces for learning on different livelihood and adaptation strategies used by cocoa farmers, though there is a lack of good farmer information and training resources.

The industry's nascent community development programs are addressing some of these factors, particularly those that build savings, increase literacy, access to education, and provide training. Grow Cocoa, a partnership between Olam and Blommer Chocolate, is focusing on the provision of health services and education in their community development programs in Côte d'Ivoire.

Adaptation can also include diversifying beyond cocoa. Farmers need the knowledge, capacity and market access for other crops to diversify their incomes, which can increase resilience to weather shocks that might affect one crop more than others. Mondelez' Cocoa Life program tracks ten key performance indicators, one of which is 'Cocoa farmers' reduced vulnerability to external shocks'. The CSC Program should be able to help make such indicators more (location) specific.

Pillar 3 – Mitigation

The FAO's definition of CSA includes a third pillar regarding low carbon agriculture that reduces/removes GHGs where possible. When considering whether cocoa industry programs are already climate smart regarding GHG mitigation, we need to consider this from two different perspectives: (1) global corporate strategy, and (2) product based programs. A prime example that several companies are connected to (and is further discussed later in the document) is the recently approved Ghana Cocoa Forest REDD+ Program as part of their Emissions Reduction Program.

Global corporate strategy

First-mover multinationals often set a climate policy from the perspective of the entire company's carbon footprint. Tools like materiality analyses, life cycle analysis, and science-based targets provide methods of developing GHG emissions reduction commitments. These corporate climate commitments are often based on reducing the largest sources of emissions and those under the company's direct control, typically from processing and transport. For consumer goods companies with broad product ranges, such as Nestlé and Mars, agricultural raw materials are not the primary focus for mitigation. Nestlé for example met their 2015 mitigation goal (-42%/ton), mostly through efficiency improvements, renewable energy and conservation measures.

Product based programs

Companies that depend on a high volume of a small number of agricultural raw materials often have climate programs focused on GHG emissions reductions at that crop/farm level. Nestlé and Danone are clear examples from the dairy sector. For mitigation programs focused on cocoa specifically, the GHG mitigation discussion is focused on preventing deforestation. Life cycle analysis of cocoa production and trade show that environmental impacts including GHG emissions are highest at the production stage, with the emissions from land use change (i.e. deforestation) being the largest source of GHG emissions. Initiatives like Olam's collaboration with Rainforest Alliance to establish climate-smart cocoa plus reforestation are addressing mitigation and productivity in an integrated manner.

In conclusion, several sustainability programs of the cocoa and chocolate industry contain elements of all three pillars. Most notably, ongoing and new cocoa rehabilitation and renovation initiatives bridge the productivity, adaptation and mitigation pillars. If farmers remain stable and are able to access the skills, financial support and planting material to renovate their older trees, they can increase productivity per unit, prevent further deforestation and become more financially resistant to shocks. Barriers to widespread renovation and rehabilitation are well researched and include the high risk of long term credit, the loss of a farmer's income while trees are not producing, and the lack of access to good planting material and effective technical assistance.

Private sector commitments and activities in the CSC landscape

Corporate investments and commitments are generally not exclusively related to climate change, but rather to the multifaceted issues of (i) ensuring that supply chain accountability is possible through certification and traceability programs, (ii) productivity gains are achieved through professionalization of farmers and improved planting material, and (iii) reducing the risk of a supply chain contributing to climate change drivers through deforestation (or identifying opportunities to reduce the carbon footprint of farms).

Classifying private sector commitments and activities related to climate by these issues illustrates the distribution of stated priorities across different kinds of companies. In general, brands are more likely to state measurable targets such as volume of sustainably sourced beans or a smaller carbon footprint. Traders may be present in all initiatives, but often at a sub-set of sourcing regions and reflecting the specific preferences of their customers rather than a global strategy. Interviews show a shift from an

emphasis on certification and Good Agricultural Practices (GAP) training to the inclusion of landscape programs on deforestation, more private-public partnership and a focus on farmer professionalization.

Table 1. Summary of climate-related commitments and activities of the private sector

Climate-related commitments and activities	Description	Primary advocates
Certification and/or sustainable sourcing	Commitments are focused on either sourcing 100% of key ingredients such as cocoa through certification or sustainability programs that offer some amount of traceability.	Primarily brands, and traders
Carbon footprint	Carbon footprint and GHG emission reduction commitments appear to be primarily the concern of the more visible brands.	Primarily brands
Planting material	Widespread distribution of especially productive, disease & pest resistant, and drought tolerant cocoa clones forms the strategic cornerstone for a small number of very large brands' approaches to sustainability.	Primarily brands
Preventing deforestation	While a relatively new addition to the list of corporate commitments, both brands and traders are making net-zero or even net-positive deforestation commitments. For those companies who have done carbon footprint analyses, land use change quickly rises to the top of priority climate commitments.	Traders and Brands
Professionalization of farmers	Common professionalization targets include multiple-fold increases in yield, quality improvements, ensuring training and access to inputs and replanting support. Often aggregation of farmers and financial capacity building form a key part of this strategy.	Both, but more traders

Cocoa-Climate Landscape and sector investments in CSC

In West Africa, the cocoa value chains are well established and quite central to the governments', particularly in Côte d'Ivoire and Ghana. In both countries, considerable policy and institutional reform processes are underway regarding the nexus between cocoa, forests and climate change. These efforts are strongly related to the work of the national REDD+ secretariats, which can be seen in other West Africa countries. This process is not easy to comprehend, and some companies struggle to see opportunities for engagement and investment. The CSC Program will make it a priority to provide clarity on these processes and point out the potential entry points. Please refer to Annex 3 for a non-exhaustive summary of initiatives in CSC Program Landscape.

Côte d'Ivoire has numerous larger and smaller initiatives. Most of them have some type of representation through Le Conseil du Café-Cacao's (CCC) public-private partnership platforms (PPPP), particularly the Thematic Group on Environment and Climate Change (which is open to all actors). Also, the different larger public and private initiatives have largely divided up the cocoa regions. Conservation initiatives are mainly focusing on the few remaining biodiversity hotspots and on the last remaining large intact national park the Taï forest. The key government program that provides an entry point for engagement on the topic of CSC is 'Cacao Ami de la Forêt', managed by the CCC, linked to the national sustainability program Quantity, Quality, Growth (2QC). Finally, the Initiative for Sustainable Landscapes (ISLA), by the Sustainable Trade Initiative (IDH) is the most visible forum on agroforestry.

Ghana also boasts of numerous projects large and small, and has seen a large boost in attention for CSC, partly because much of the initial climate modelling and science by CGIAR and partners was performed in Ghana. The CSC concept features prominently in the freshly approved ERPD with a dedicated program the 'Ghana Cocoa Forest REDD+ Program' (GCFRP) which is jointly managed by Ghana Cocobod and the Forestry Commission and aims for results-based payments from the WB's Green Climate Fund. COCOBOD had made CSC central to its upcoming Cocoa Sector Strategy Document II. The principles of CSC and Landscape Management used in the GCFRP are already reorienting many program partners, including the World Bank's Forest Investment Program, and also under added impetus from the Palladium Group's Partnership for Forests Program. Ghana has a working group on the development of a CSC standards and a budding Thematic Working Group on Environment and Climate Change, to be housed under the yet-to-be-revived Ghana Cocoa Stakeholders Platform.

In *Liberia*, the main entry point for engagement on CSC is the LIFE III project (<http://www.acdivoca.org/projects/livelihood-improvement-for-farming-enterprises-life-iii/>) implemented by ACDI/VOCA, a key partners to the CSC Program. Working in Bong, Nimba, Lofa, Gbarpolu, Grand Gedeh, and River Gee counties of Liberia, the USDA-funded program works to empower over 10,000 smallholder cocoa farmers, farmer organizations, and suppliers to improve livelihoods by increasing the productivity, profitability, quality and marketability of Liberian cocoa.

Central America has a very small share in the world market of cocoa (approximately 0.6%) and yet is a reliable source for high quality, fine flavor beans for the specialty market. The growth of the cocoa market at the regional level during 2011-2016 has been around 29%. In 2016, the Central American Agricultural Council, a regional coordination platform of the Ministries of Agriculture from all Central American countries, prioritized the cocoa value chain for analysis of climate change adaptation needs and actions.

Currently *Honduras* produces approximately 1500 MT of fine aroma cocoa. It is expected that from 2017 onwards, there will be a major boost of production and quality in the cocoa sector as a result of a number of cocoa development projects. This includes the flagship project PROCACAO implemented by Fundación para el Desarrollo Empresarial Rural (FUNDER), Fundación Hondureña de Investigación Agrícola (FHIA) and Asociación de Productores de Cacao de Honduras (APROCACAO) with sustained funding from the Swiss Agency for Development and Cooperation to foster improved cocoa agroforestry systems with 3000 small holders. Currently private and public sector actors are actively engaged in the national cocoa sector development.

El Salvador has small area of cocoa agroforestry systems in production. The USAID-financed Cocoa Alliance is a flagship program to put in place 6,500 ha of new cocoa agroforestry systems with productive clones under irrigation. The implementation of this five-year national initiative led by Catholic Relief Services (CRS) will place El Salvador as a key fine aroma cocoa growing country of the region. However, the private sector actors of El Salvador are in the early stage of consolidation along with the cocoa value chain itself.

Currently *Nicaragua* produces around 7,000 MT of cocoa and one-hundred percent of the production comes from smallholders who are supported by public-private projects like 1) PROCACAO - implemented by Ministry of Family Economy and Cooperative Associativity (MEFCCA) and United Nations Industrial Development Organization (ONUDI) with funding from the Swiss Agency for Development and Cooperation; 2) NICAADAPTA implemented by MEFCCA with funding from World Bank, IFAD and Banco Centroamericano de Integración Económica (BCIE); 3) PROGRESA Caribe implemented by CRS and Lutheran World Relief (LWR) with finding from USDA; and 4) Adapta implemented by Ingemann with funding from IDB (Inter-American Development bank).

However, according to a study carried out by ONUDI, by 2022 the production of Nicaragua may reach around 30,000 MT and 60% of the cocoa production will come from new large scale plantations owned and managed by private sector companies (Cacao Oro, Ritter Sport, Bean & Co and others) which have the potential to act as cocoa landscape development platforms by pulling in surrounding medium and small-scale holders via outgrowth schemes and investment that will enhance productivity and climate change adaptation and resilience of the cocoa sector.

PART II – Key areas for piloting innovations under the CSC Program

The initial focus of the CSC Program is on the development of strategies for addressing climate change threats to farmer livelihoods in cocoa-growing regions. This inception report aims to inform and incite initial discussions towards the development and implementation of a shared CSA strategy for cocoa landscapes. Three initial key areas (CSA training, agroforestry marketing systems and planting materials) were identified for the piloting of innovations during the development of the program itself, in collaboration with the CSC companies and with USAID. This section discusses these three key pilots in greater detail.

Short-term: Updating cocoa curricula to incorporate CSA considerations

Farmers in West Africa and Central America have varying levels of knowledge about climate change, its predicted impacts, and adaptation measures they can take in the short and long term. Farmers

however remain largely oblivious to the climatic risks they are likely exposed to under certain farm investment strategies (e.g. full-sun, intensified cocoa) in increased climate risk areas. Bridging these knowledge gaps will be essential to increasing cocoa farmers' investment and engagement in CSA practices. Through past and present programs, effective farmer training methodologies have been developed and these programs can be leveraged to build farmers' capacity regarding CSC practices. Both COCOBOD in Ghana and Conseil du Café-Cacao in Côte d'Ivoire use harmonized training materials to train cocoa farmers. However, the practices recommended in these curricula are the same for every farmer, irrespective of location and farmer profile. Based on extensive research activities and the climate impact predictions carried out by CCAFS and Rainforest Alliance, the CSC Program will use the characteristics of each zone to develop training materials with specific climate-smart advice tailored to different types of farmers.

The new CSC curriculum (a set of supplementary training modules) being developed by WCF and Rainforest Alliance will be used to train public and private-sector extension agents on CSA practices for cocoa through a series of workshops in Côte d'Ivoire and Ghana beginning in the third quarter of 2017. Actual use of the CSC curriculum with farmers will be supported through other projects such as the WCF CLP and, hopefully, companies' own programs. It will also connect to innovative technologies, such as a locally-produced video-based training methodology and the use of smartphone applications. The CSC curriculum could be potentially adapted for use in other countries in the region including Cameroon, Liberia, Nigeria and Sierra Leone. Several companies have expressed their interest in piloting such a curriculum.

In Latin America, smallholder farmers also need better foresight of the challenges arising from climate change, and an improved capacity to make informed choices. Here, the CSC Program will initially review and update the Cocoa Toolkit developed by Lutheran World Relief to improve and innovate cocoa agroforestry systems and incorporate climate-smart cocoa practices. The guides are [available online](#) and are used for conducting local training and analysis. Strategic adaptation of these guides to incorporate key ideas for climate change adaptation for cocoa agroforestry is expected to be a best-bet starting point. The updated toolkits will be reviewed by WCF with private sector companies and knowledge partners like the CGIAR Programs (again including Rainforest Alliance (RA) through the CCAFS), to ensure relevance and utility. The CSC Program will also research CSA tools and materials in other sectors, such as coffee, which can be adapted for use in the cocoa and forest products sectors, for example through collaboration with the USAID funded Alliance for Resilient Coffee in Central America. Of course, cross-learning will happen between the Latin America and West-Africa team on these two impact pathways.

Our initial focus is on Ghana, where the harmonized cocoa curriculum has just been reviewed but does not cover climate change in detail. In Ghana WCF will collaborate with Rainforest Alliance to create a specific supplementary CSC curriculum. In Côte d'Ivoire, it is expected WCF will repeat the exercise also in collaboration with UTZ (will be merging with RA) as part of their Sector Partnership Program, including the necessary participatory validation work to make it applicable to the Ivorian context.

Rainforest Alliance together with the CSC Learning Community members—based on the climate change impact maps for cocoa—invested in considerable participatory research to develop site-specific CSA packages of recommended cocoa farming practices in Ghana. As our research partners CIAT and IITA are publicly funded, as well as the CSC Program, this is a pre-competitive effort that will be usable for any certification or training initiative. Central to the work are site-specific investment pathway recommendations clustered roughly around eight large topics: 1) the basics of CSC; 2) establishment phase; 3) pest management; 4) shade management; 5) soil management; 6) water management, harvest and post-harvest handling; and 7) enabling environment. Recommendations differ per the three climatic impact zones discussed earlier. It is important to stress that very few practices will be 'new', CSA (and hence CSC) is all about site-specific and smart combinations of existing practices (and the elimination of ill-advised practices) that address particular identified climate hazards or threats. The CSC packages for Ghana were developed taking into consideration country-specific guidelines on the sustainability of the cocoa crop as set out by CRIG and other industry actors, and the same process will be applied in Côte d'Ivoire.

Farmer segmentation techniques are used to profile farmers in the curriculum so that even within the climate zones no one-size-fits-all solutions are proposed. In fact, the CSA packages will be proposed using a stepwise investment pathway approach. In each impact zone, farmers will need to adopt a minimum set of recommended practices but can subsequently be advised to aim for an additional 'bronze', 'silver' or 'gold' level investment pathway, all of which aim for a different level of outcome level. Once it is released and validated—which is expected to be in October 2017 in Ghana—the CSC training curriculum will be presented in detail to public and private trainers and trainers-of-trainers within the cocoa extension system to ensure uptake and hopefully scaling. The curriculum will include attention to the necessary facilitation skills and provide farmer hand-outs to ensure a thorough understanding of climate change impacts and climate smart cocoa practices.

Another opportunity may be also use 'Digital Green' for the CSC curriculum. Digital Green is an enhanced extension delivery mechanism which uses video technology to reach out to farmers. The approach leverages peer-to-peer learning processes to increase farmers' adoption of GAP. Digital Green, piloted under CLP-I and expanded under CLP-II, features members of the community showcasing GAP in an instructional "how-to" video. These videos are produced by community extension agents or members of the communities themselves, and are then shown to various farmer groups, leveraging pre-existing social structures. WCF can lend its video production equipment to members, assist in the content development and facilitate the capacity building of members to produce and disseminate these videos.

Medium-term: Facilitation of market linkages to support development of agroforestry

Under the CSC Program, ACDI/VOCA—as a sub-grantee—is implementing an 18-month CSC pilot in Liberia. The pilot focuses on improving market outcomes among cocoa agroforestry smallholders to build market incentives for a climate-smart approach. This is a whole-farm, landscape-level, systems-based approach that includes cocoa and non-cocoa products that serves to sustain producer engagement in cocoa and agroforestry, decrease expansion of cocoa farming systems and foster resilience while increasing cocoa quality and supply.

ACDI/VOCA undertook a cocoa agroforestry market analysis in which it identified oil palm, cocoa, plantain and timber as priority crops for the Liberia pilot to focus on. ACDI/VOCA then identified profitable end market opportunities, constraints actors face in attaining those, and interventions to address those constraints. The ambition is that this analysis will guide project interventions beyond Liberia in Côte d'Ivoire and Ghana. An initial set of key opportunities, related constraints and possible interventions were already identified based on crop strengths and challenges (Table 2. Cost/benefit analyses are needed to prioritize and further select from these options in the future.

Table 2: Summary Opportunities, Constraints and Intervention Areas for Target Value Chains (VC) in Liberia

Crop	End Market Opportunities	Constraints	Intervention Areas
All commodities	Value-added products aimed at domestic urban consumers	- Constricted markets - Transportation challenges - Lack of finance for processing equipment - Lack of training on processing	- Train producers and entrepreneurs on value-added processing (esp. women) - Link VC actors to credit sources for processing - Link producers and buyers to urban markets - Provide business development and marketing technical assistance to VC actors
Timber	- Import Substitution of timbers - Furniture making - Higher-value markets for sustainable production - Nurseries	- Limited training to process timber - Limited market linkages	- Training on timber processing - Links to domestic end markets and importers paying sustainability premiums
Oil Palm	- Value-added products: soap, lotions and creams - Import substitution of refined oil - Higher-value markets for Dura varieties and sustainable production	- See "all commodities" - lack of credit for processing entrepreneurs - Lack of cost competitiveness among small firms - lack of market linkages for higher-value markets	- Link producer groups to credit for purchase of shared oil press - Training equipment operators - Business and marketing TA for producer groups and other actors - link to higher-value markets

Plantain	- Processed products, segmented for infants/children and older populations	- See "all commodities"	Organization and formalization of groups to get credit to purchase equipment. Training of equipment operators and provision of business development services (BDS)
Cocoa	- Higher-value markets rewarding quality and sustainability - Sale of processed products like powder and butter (domestic)	- Limited buyer linkages - Limited links to higher-value markets - Lack of finance for fermentation and drying infrastructure	- See "all commodities" - link producers to higher-value markets and finance - Training on value-added production (esp. for women)

In the second half of 2017, ACDI/VOCA consulted with partners in Côte d'Ivoire and Ghana to identify opportunities to integrate agroforestry into program activities. The objectives of the preliminary work were to 1) gain an understanding of partners' projects, resources and the agroforestry systems typical of the producers they are working with; 2) identify potential end market opportunities for cocoa agroforestry products from those producers; 3) characterize how producers are currently marketing those products; 4) identify ways producers could improve their marketing efforts and outcomes; and 5) identify ways companies can implement activities to encourage smallholder adoption of agroforestry and improved market outcomes. A preliminary report, brief informational materials and presentations are expected to become available in the fall of 2017 for public consumption, and WCF members that facilitated field visits by ACDI/VOCA will benefit from individual recommendations.

Long-term: Screening and breeding for drought and heat tolerant planting materials

There is no general agreement on how climate change will affect the cocoa sector. This is due in large part to our limited understanding of the biophysiological capacities and limitations of the cocoa plant. Cocoa originally comes from the tropical Amazon and is evolutionarily adapted to the role of an understory tree with temperatures ranging from 22°C to 27°C and constant precipitation. Research on the full potential of cocoa genetic diversity to respond to extremes like high temperatures and water deficit remains under-funded and highly fragmented. The key to climate resilience may therefore lie in the selection and breeding of drought and heat tolerant genotypes. If cocoa can be made more resistant to heat and drought—and if this improved planting material can be mainstreamed in the coming decades—current climate change impact predictions may be less relevant.

The private sector and international research institutes have made great advances in genetics research, use of technology, and propagation methodologies. However, these groups need to collaborate with national public-sector partners to take the lead and bring this knowledge onto the field. Through conversations with several private sector companies around climate change, the identification of drought resistant planting material was determined to be a key industry priority. The CSC Program collaborates with Bioversity International to screen and breed for drought tolerant cocoa materials and anticipates that additional funding will expand the scope of the work, connecting to all the major other stakeholders, including CATIE, CIRAD, University of Reading, and the national agricultural research institutes.

After an initial assessment and the creation of a work plan, the focus of the CSC Program has been 1) to get a clear understanding of the current knowledge on the physiological response of cocoa and existing genetic diversity to drought and high temperature tolerance; 2) to map out the institutional landscape and partnerships on cocoa drought and high temperature tolerance research; and 3) to develop a pragmatic framework for a drought and high temperature tolerance research program and related priorities for the next 3-5 years. The CSC Program also aims to support field trials in Latin America beginning in 2018. With the support of heavily-invested members including Mars and Nestlé, hopes are to see results before the peak of climate change impacts.

In West Africa, this work links with the WCF African Cocoa Initiative on supporting the African Cocoa Breeders Working Group (which includes CRIG and CNRA). In Latin America, this work operates through the Americas Cocoa Breeders Working Group.

The CSC Program aims to focus on: (i) screening of genetic diversity with common tools, methods and standards for agreed traits that translate into drought and heat tolerance for increased productivity; (ii) identification of tolerant materials to drought and heat while ensuring relevant regional pest and

diseases resistance and good quality and flavour; (iii) testing on multi-sites – under a range of environments and agricultural practices – and monitor performance; (iv) integration of selected material into breeding programmes to develop improved varieties with national and regional specificities; (v) evaluations in farmers' fields; and (vi) multiplication and distribution resilient improved material to farmers' fields.

An initial desk research report by Bioversity International summarizes the status of published research, while we await a full report also including research that will be published later this year. Some of the key observations include:

- Climate change models are only as good as the quality of the data provided into the model. For many regions, reliable climatic data is unavailable and models should be interpreted with caution.
- The genetic base of cocoa is broad, providing ample opportunity to work on drought and heat tolerance. Though the potential is strong, a striking lack of research is observed in comparison with other commodities.
- Four main types of physiological responses to drought and heat have been identified as a key focus for breeders.
- Sufficient genetic variation exists to select and breed for superior cultivars within existing collections. The combining potential of selected cocoa cultivars is looking promising.

WCF is also coordinating with the University of Reading, which has developed a greenhouse facility to stimulate future climatic conditions in cocoa producing areas in which CO₂ concentrations could be elevated. The resulting facility allows cocoa plants of pod-bearing age to be studied under simulated climate change conditions. Ongoing research focuses on exploring responses to elevated CO₂ and water deficit and their combined interaction on vegetative growth and yield components in cocoa. Future collaborative activities by Reading will focus on developing germplasm screening tools, developing understanding of interactions of genotype and environment, predicting the impact of climate change on crop yields, and on understanding how disease is impacted by drought.

Although future climatic predictions are worrisome, there is an expectation that sufficient genetic material exists within national and international collections to allow for the establishment of improved resilient planting material. However, more research is needed, and future trials should include a wider genetic base and conduct field experiments.

PART III – Exploring other CSC themes and pilot initiatives

The CSC Program is committed to continuously exploring additional areas and themes of interest to our companies and partner organizations. As discussed at the beginning of this report, climate-smart cocoa encompasses not only increasing productivity and incomes, but also a simultaneous focus on ending deforestation/forest degradation and attention to food security and socio-economic development. For these reasons, this section briefly summarizes other themes and areas we have identified as potential candidates for joint learning and CSC pilot activities. Each subsection looks at current knowledge levels, regional differences, the direction of change and perceived threats, open questions, proposed solutions and possible opportunities for private sector to engage and invest.

Initial CSC Program activities are presented, but at the end of each section we draw attention to potential pathways for additional learning and piloting, to guide further discussions, in a box like this:

Potential learning and piloting:

In general terms, each target country, and cocoa regions as a whole, would benefit from a joint development of a coherent CSC research agenda (agreed upon by all major and relevant international and national research actors), for the short, medium and long term. A joint research effort can help align the sector, generate synergies between funding sources and focus individual and collective engagement and investment efforts.

Forests and Deforestation

The risk to farmers from climate change is exacerbated by the destruction and degradation of standing forests. However, action at the farm level, even if it incorporates all three pillars of CSA, is insufficient to address deforestation and build climate resilience at scale. Landscape-level action is required to halt the levels of deforestation seen over the last decade in West Africa. The cocoa sector is committed to ending deforestation and forest degradation in the sector. In March 2017, during a meeting convened by ISU, WCF and IDH, 12 of the largest global cocoa chocolate companies launched the CFI with a collective statement of intent to commit to working together pre-competitively to end cocoa-related deforestation. As of June 2017, over thirty companies together with public sector players have pledged to develop and present a Joint Framework of Action to end deforestation and forest degradation in the cocoa sector, initially for Côte d'Ivoire and Ghana. This framework will be presented at the Climate Change Conference of Parties 23 (COP 23) in Bonn in November 2017.

Key components of CFI are developing clear consensus on key definitional issues and collaborating with origin governments. 'Deforestation' itself is a problematic concept that lacks a clear definition, which means any promise to halt needs clear operationalisation. Ghana defines a forest as "any piece of land with a minimum area of one hectare, with a minimum canopy cover of 15% and with trees that have the potential to reach or have reached a minimum height of five meters at maturity in situ." Côte d'Ivoire uses the same definition but requires 30% minimum canopy cover. WCF also takes an active interest in keeping abreast of developments in testing the High Carbon Stock (HCS) and High Conservation Values (HCV) approaches, as a methodology for putting into practices no deforestation commitments within smallholder farmer cocoa production, particularly in West-Africa. Several members have also recognized that important opportunities lie in working with the national REDD+ secretariats (but also non-traditional partners like the timber industry and other land use groups) to design landscape level approaches that allow cocoa to leave natural forests and bring more forests into the cocoa farms, while achieving national goals regarding sustainable cocoa production, REDD+/Emission Reduction Programs, and national social and economic development strategies.

WCF members are conscious of cocoa's role as a major driver of historical and ongoing deforestation, particularly in the Upper Guinean Rainforest, where annual national deforestation rates are sometimes well over 5%. Cocoa is a pioneer crop that for decades has been grown using the 'forest rent' after forest clearing instead of replanting aging plantations. In both Côte d'Ivoire and Ghana, the 'cocoa frontier' moved from the drier east to the wetter west under the impetus of strong migratory streams. With 'available' forest areas practically depleted in Ghana, today this means a final push into the last large forested areas of southwest and increasingly into Liberia and encroachment into forest reserves and other protected areas in both Ghana and Côte d'Ivoire. In Côte d'Ivoire, roughly one-third of cocoa production is estimated to come from areas earmarked as forest reserves or even national parks. About half of the protected forests are heavily encroached by smallholder farmers.

In the absence of strong traceability systems, illegally-sourced cocoa from protected forests inevitably ends up in the general value chain. Increasingly, WCF and industry partners are collaborating with social, environmental, and governmental knowledge partners to better analyze these issues in members' value chain operations and act on the results. Improved satellite imagery and remote sensing technologies are increasingly making it possible to reliably distinguish cocoa trees from forest—a limitation that has held cocoa deforestation monitoring back for decades.

In its role as a center for learning on deforestation in cocoa, WCF co-commissioned an in-depth study by Climate Focus for the World Bank on eliminating deforestation from the cocoa supply chain. The study examines the issue of deforestation in the supply chain and the role and limitations of certification. Deforestation-related commitments across the value chain are analyzed and a comparison is made with palm oil, another smallholder crop with similar challenges regarding deforestation to cocoa. Finally, the study describes a vision for zero-deforestation cocoa with key principles and strategies. Though this study is an important building block of the Cocoa and Forests Initiative's Joint Framework of Action, more work remains to be done on defining deforestation, tracing

Climate Focus/World Bank: 'Eliminating Deforestation from the Cocoa Supply Chain'

Climate Focus/World Bank: '[Eliminating Deforestation from the Cocoa Supply Chain](#)'

cocoa from protected forests, and building consensus on appropriate in-country landscape-level actions.

Potential learning and piloting:

- The WCF currently works with partners like the World Resources Institute to build knowledge and help improve tools such as Global Forest Watch, 'a dynamic online forest monitoring and alert system that empowers people everywhere to better manage forests'. Members can contribute data, ideas and look into innovative usage of the platform.
- Both in Ghana, in collaboration with the forestry services, sustainable options and strategies need to be further examined for a contract with cocoa farmers farming illegally in protected areas, to gradually exit the degraded forest. Temporarily still able to sell their cocoa, they are expected to actively contribute to the restoration and regeneration of the forest. The terms used are 'grandfathering' and 'contractualisation', in English and French respectively, but these are only similar, not equal in their meaning.
- Based on national framework agreements and the new forestry code, innovative collaboration with the timber industry could lead to achieving a joint cocoa-timber outgrower schemes for 25 to 30-year plantation cycles.
- Recently the quality of satellite imagery available in the public domain has dramatically improved. These can be used for deforestation warning systems, potentially in constructive collaboration with CSO's.
- Land-use in cocoa growing areas can be jointly monitored (this is for instance going to be assured in Ghana under the GCFRP) to assess changes in tree cover and diversity of trees. Data may possibly lead to results-based payments from carbon funds, down the line. The data for collective analysis can be shared using online information systems. Some examples are <http://aprocacaho-sistema.com>, <http://acicafofoc.pythoni.org/>, and <http://innovacion-addac-fadcanic.org>.

Investigating the business case for cocoa agroforestry systems

Agroforestry as a term and concept is coming back in vogue in cocoa, particularly in Côte d'Ivoire, despite the lack of a clear and universal definition. Many organizations stress that enhanced productivity and increased household income can only be achieved via the development of diversified agroforestry value chains informed by sound business plans and supported by innovative financial arrangements. Diversified, profitable, high value cocoa agroforestry systems could certainly help address the need for CSA solutions. However, few experts have clear and realistic ideas on how such systems should be agronomically designed and maintained in each of the specific agro-ecological zones and climatic impact zones. That said, increasingly new research is coming out on the trade-offs of increased use of shade trees. Several of WCF's members are interested in strategies and/or are actively experimenting with agroforestry.

Multiple sources claim that existing cocoa agroforestry systems in Latin America and West Africa have poor productivity (250-400 kg/ha) and generate low incomes for farm households (USD 400-600/ha), but others question these numbers. This is despite dedicated efforts by farmers, farmers' organizations and the industry to improve productivity and quality of cocoa (and to negotiate better prices via certification and many other means in all the cocoa producing countries of Central America and Caribbean). Other food and cash crops coming from agroforestry systems are also not always taken into account when calculating the benefits for farmers, adding to the lack of clarity on the farm-level business case for adopting agroforestry practices. Key actors generally agree that it is imperative to foster high-value, diversified, cocoa agroforestry systems that should not only recover cocoa productivity, but should also help cocoa growers to adapt to the climate change and increase their income through the sale of products (cocoa, banana, fruits, timber) and incentives for ecosystem services (water, carbon and biodiversity).

A good agroforestry design ensures the optimum use of space, water and nutrients for all the trees and plants in the system. Planting density of cocoa and the accompanying trees and plants must be defined by analysing the growth pattern and potential of each species, the inputs and outputs of nutrients in the system and the type of management that they will require. The nutrient and shade requirements of the selected cocoa variety should determine the type and planting density of the accompanying plants (e.g. banana, pigeon pea) or trees (service, fruits or timber).

Cocoa producing countries view agroforestry as a potential solution to a variety of challenges in the value chain. In El Salvador, cocoa agroforestry systems are viewed as a way to restore and conserve biodiversity for sustainable rural development. In the Dominican Republic, cocoa agroforestry systems

are proposed to conserve important water resources, and stakeholders in Honduras and Nicaragua see the potential to restore vast stretches of degraded lands. In Côte d'Ivoire, IDH launched the 'Initiative for Sustainable Landscapes' (ISLA) some years back, which aims to jointly investigate cocoa agroforestry models. However, despite highlighting many of the positive features, none of the agroforestry systems showcased by ISLA boasted a convincing business case or a realistic return on investment for the smallholder farmer, even after 10 years.

Potential learning and piloting:

- Clear examples of agroforestry systems, especially as compared to traditional cocoa remain to be identified and assessed. Joint learning is necessary from ongoing pilots on cocoa agroforestry systems, and assess to the performance including that of the other products harvested within the system. This can happen within members' operations or within a variety of other initiatives—immediately or if necessary under a time-bound non-disclosure agreement (NDA)—including the use of comparable metrics and the same research questions and cost-benefit analysis approach.
- The private sector may need to take a more active and critical role in designing and assessing realistic profitable agroforestry systems (which certainly will look more like farms than like rainforests). This work is critical, as reinvented agroforestry systems will need to avoid the historic low productivity of badly managed extensive agroforestry that has shown to heavily contribute to expansion of cocoa farming and associated deforestation.
- Development realistic investment and business plans is needed for cocoa agroforestry systems including an attractive diversity of products and ecosystem services, for different climatic impact zones and regions.

Optimal shade levels

A recent comparative study (Jazeer et al., 2016) compared the financial and biodiversity performance of small-scale shaded coffee and cocoa plantations versus intensified conventional ones. Results show that, contrary to common perceptions, profitability and cost-efficiency are higher for small-scale shaded systems. Despite the lower yields for shaded systems, the lower costs per area and potential higher price per kilogram of coffee or cocoa means shaded systems may perform better financially in certain contexts. The study proposes that more detailed indicators such as net revenue or benefit-cost ratio should be used instead of yield. Few studies specifically reported on the relationship between biodiversity and financial performance, but various papers showed a promising optimum relationship for intermediate levels of shade.

Also, recent in-depth work by CGIAR/IITA and the University of Copenhagen shows that the sector needs to reassess the longstanding argument that shade trees limit productivity. Shade tree canopy can have a positive impact on yields depending on the crown area, and canopy cover coupled with modest fertilizer use will give the best results under low input smallholder cocoa cultivation. However, fertilizer application must be targeted and site-specific.

Advancing CSC requires a better understanding of the relationship between canopy cover and cocoa yields on smallholder farms. Canopy cover alone is inadequate in ameliorating the microclimate under cocoa production in the current climatic context. Valuable trees planted within cocoa agroforests could offset any perceived yield losses in the shade-yield relationship compared to full sun-production systems. In Ghana, achieving 15% crown cover with shade trees at a cocoa landscape level may also qualify operators for results-based climate funding, since that threshold effectively turns cocoa farms into 'open forests'.

Online shade tree tools:

The CGIAR/ICRAF Agroforestry (AFT) Database is a species reference and selection guide for 600 agroforestry trees. These can be deliberately grown or kept in integrated land-use systems and are often managed for more than one output. The database provides information on the management, use and ecology of a wide range of tree species: <http://www.worldagroforestry.org/output/agroforestry-database>

Another tool, the CGIAR/IITA Shade Tree Advice tool, helps to select appropriate shade trees based on farmer preferences. After selecting different attributes such as ecosystem services and weighing and prioritizing the attributes, the database displays the most appropriate trees as well as associated performance information: <http://www.shadetreeadvice.org/>

Potential learning and piloting:

- More comparable, long-term, multidisciplinary, climate-smart research is needed in this highly under-researched area. Objectives of this work on shade management might include establishing the optimal shade levels for cocoa in

the different ecological zones, looking at labour costs, or determining optimal spacing of cocoa for the different climatic zones.

- Countries have made reforestation commitments and defined minimum crown cover rates (15-30% shade) in forest definitions for ERPs. Which tree combinations are needed to achieve such rates in a landscape is unclear, but necessary to use as a minimum threshold in rehabilitation and restoration effort if they are to qualify for national policy.
- Based on recent research IITA and WCF can easily achieve a shade tree crown cover calculator for key shade trees, based on measuring the age and diameter at breast-height (DBH).
- The use field exercises with cocoa growers is proposed to analyse shade cover, shade diversity and shade distribution of cocoa plots to improve decision making on optimal shade levels and monitor impact of shade management on yield and quality of cocoa (<http://alianza-cac.net/herramienta-cacao/>).

Innovative finance mechanisms

“Climate smart finance” refers to the targeted use of financial products to facilitate investments in improved agricultural productivity, mitigation of climate change or adaptation to climate change. Given the mix of episodic shocks and ongoing stressors associated with climate change, the climate challenge will require both short-term and long-term finance [see box]. The biggest long-term finance challenge remains the funding (possibly through a blended finance vehicle) of renovation and rehabilitation (R&R) of diseased and aged cocoa farms, especially in West-Africa. WCF and its partners, including International Finance Corporation (IFC) of the World Bank, the Initiative for Smallholder Finance (ISF), , this first of its kind collaboration between the Ghana Cocobod and Forestry Commission aims to curb emissions driven by expansion of cocoa into forest areas, whilst also addressing illegal logging and chain sawing, and illegal mining. By tackling these drivers, Ghana aims to: 1) significantly reduce carbon emissions resulting from cocoa expansion into forests through the promotion of appropriate climate-smart cocoa production approaches, including intensification and yield enhancement; 2) curb illegal timber harvesting and mining, while incorporating shade trees in cocoa systems; and 3) build climate-resilience for the cocoa sector in order to secure rural livelihoods and sustain national development.

The GCFRP has selected nine cocoa landscapes, or Hotspot Intervention Areas (HIA), (see Annex 4) based on the intensity of the drivers of deforestation and forest degradation and leveraging existing projects and interventions being implemented by private sector and state actors. For each HIA a landscape governance body will be put in place, drawn from the relevant land use stakeholders, with the objective to complete climate-smart landscape management plans and implement these. There is widespread agreement in Ghana that developing and implementing landscape management plans will be one of the main activities that will lead to reducing deforestation. Outside of urban areas, there is virtually no landscape level land-use planning.

The essence of a consortium is to ensure that all the major stakeholders, actors, and entities existing or operating in the landscape are working together towards a common goal of reducing deforestation and

Common categories of financial products

Short-term debt (less than one agricultural season)

- Pre-financing of agricultural inputs (e.g., fertilizer)
- Receivables financing, such as factoring to facilitate post-harvest trade
- Inventory financing, e.g. warehouse receipts finance

Long-term debt (more than one agricultural season)

- Capital expenditure financing, including infrastructure (e.g., clean technology, irrigation)
- Renovation finance for replanting

Equity investments (buying and holding of shares of a company's common stock)

Risk transfer

- Insurance, including both index and indemnity products
- Derivatives

Recommended papers:

- Value Chain Finance for Agricultural Climate Change Resilience.
https://publications.cta.int/media/publications/downloads/1968_PDF.pdf
- Financing Farm Renovation
<https://info.rootcapital.org/financing-farm-renovation-how-to-build-resilience-using-a-blend-of-capital>
- Making Climate Finance Work in Agriculture
<http://documents.worldbank.org/curated/en/986961467721999165/pdf/ACS19080-REVISED-OUO-9-Making-Climate-Finance-Work-in-Agriculture-Final-Version.pdf>

degradation, and not operating in isolation, or worse, in contradiction to this goal. An important opportunity (in this case already grabbed by Mondelez and Touton) is to take on a (shared) leadership role in one of the HIAs and thereby help shape the landscape, build an HIA Management Plan and become aligned (for instance on companies' own CSC programs—which indeed both Mondelez and Touton are implementing within 'their' HIA). All cocoa emanating from these landscapes would eventually fall under a Ghana CSC production standard, with the objective to attract both carbon funding and certification premiums to help ensure sustainable landscape management, and to support Ghana's Nationally Determined Contributions (NDC).

Implementation of the HIA landscape management plan will involve broad awareness creation and trainings on CSC with community leaders and opinion leaders, conducting regular patrols of the HIA through community-based efforts together with forestry officials, undertaking land-use enhancement activities together with HIA leaders, implementing CSC practices, and negotiating grandfathering arrangements for irregular land uses. Another opportunity that this process therefore offers is concrete CSC strategy building for immediate joint implementation. While the GCFRP aims to demonstrate significant emission reductions over time by halting deforestation, this depends on hundreds of thousands of cocoa farmers and forest users changing their practices on the ground. Since this will not be simple, the benefits to these land users and land owners must be significant, clear and consistent. The central logic of the program is therefore to significantly increase on-farm cocoa productivity (and income) by creating access to critical farming resources. These are the dominant benefit to people in the program and the area of effective input provision is where companies can make a critical difference, and often contributions: i.e. planting materials, fertilizers, technical extension, business extension, financial and risk products, shade tree planting material (including promotion of assisted natural regeneration and mature shade tree maintenance) and premium price on CSC beans.

Potential learning and piloting:

Climate change impact on the cocoa sector goes beyond the farm level and sustainable natural resource management requires a landscape approach to fully appreciate and integrate the social, economic and environmental impacts within cocoa and other commodities. Collaborative multi-stakeholder approaches are needed that require public, private and civil society partners to develop landscape management plans, including land use planning. Two pilots that aim to learn how companies can help shape the landscape and attract carbon funding/CSC premiums are underway in Ghana, but more are needed in other landscapes

Land and tree tenure

The complexity of customary land tenure systems is one of the strongest obstacles to rapid change and professionalization in the smallholder cocoa sector. In Ghana, about 80% of land is owned by families and traditional authorities governed by customary norms and practices. Customary lands owned by traditional authorities are also controlled by the State, whereas the Office of Administration of Stool Lands is responsible for collecting revenues. In this complex system, land ownership is frequently subject to disputes. Land registration can improve land tenure and is possible if the person (in order of decreasing strength) is an allodial owner, holds a customary law freehold, holds a leasehold interest, or holds a lesser interest in the land. The process of deed registration differs depending on the type of land involved, is prone to conflict, involves bringing a surveyor in and costs a minimum of 100 to 200 GHS.

Traditionally, cocoa has been grown under a migratory pattern whereby migrant farmers continuously moved into new forested areas controlled by indigenous populations. This historic model of exploiting the forest rent is not sustainable in West Africa now that there are no longer large expanses of legally available pristine forests. Cocoa lands are often subject to complicated land tenure arrangements, but cocoa farmers generally have a land use right rather than secure land tenure. Removing a crop therefore entails the risk of losing that use right. Hence, there exists little incentive to invest in aggressive replanting/replacing of cocoa, and equally for land owners to allow this to happen.

A new development in this realm is the growing attention paid to tree tenure, a system in which farmers are officially allowed to register ownership of timber/shade tree. This can dramatically extend

the land use right in duration, providing opportunity for the next generation. However, as a recent USAID report points out, land and tree administration systems are disjointed, and co-sharing of benefits between tenant and landlord are untested. Also, due to technical and financial constraints of customary institutions, landscape-scale governance and land use planning within rural cocoa areas rarely happens. Presently, smallholder farms are stuck in an inefficient deadlock of contestations around ambiguous land and tree tenure terms that encourage farmers to keep unproductive cocoa farms in use. Private sector action—in collaboration with all other stakeholders—is necessary to strengthen land governance, clarify rights to land and trees and encourage farmers to invest in cocoa farm rehabilitation.

A clear opportunity lies in not only convincing farmers to conserve naturally occurring trees, but in farmers incorporating the planting of valuable timber trees into their business plans, potentially in collaboration with timber companies (who often also have reforestation quota to achieve). Not only can the value of these trees raise farmer income later in life, increased shade has important (climate) benefits in sustainable cocoa farming systems without hurting, or by even assisting productivity goals. On top of this, under REDD+ strategies, more trees on-farm can even result in transforming ‘farm lands’ into ‘open forests’ (at 15-30% crown cover depending on the country), potentially creating additional ‘Payment of Environmental Services’ benefits. The business case for more shade in cocoa may still need additional research, but should be elaborated more clearly based on available knowledge.

Effective policy for tree tenure is expected to create a whole new set of incentives, especially if these timber rights can be awarded to a more entrepreneurial younger generation of cocoa farmers (and can be translated into delayed collateral for restoration and renovation loans). Another obvious benefit lies in intergenerational farming negotiations, in which private sector can play a significant role as a much-needed third-party facilitator.

For this reason, the CSC Program, with support from ECOM and Hershey, is joining a USAID learning pilot on land and tree tenure in Ghana, managed by Winrock, with the objective to organize a knowledge event and possibly come up with specific tools and opportunities for further engagement. The CSC Program is also directly contributing to a CSC Learning Community ‘proof of principle’ on tree registration (and sales) by up to 150 smallholder cocoa farmers. These kinds of activities also show strong overlap with the policy direction chosen under the Ghana ERP.

Potential learning and piloting:

- Operationalization of tree tenure registration on cocoa farms: In line with the ERP, WCF and the LC organise a ‘proof of principle’ pilot on tree registration, ensuring that farmers own their trees, benefit-sharing is working and that legal exploitation of on-farm timber becomes a profitable and secure investment. We aim to identify and build practical ways for farmers to register planted trees using the new FC procedure and catalyze more tree planting across the cocoa belt. Deliverables include: 1) a user manual for the FC tree registration; 2) a cost-benefit analysis of different mapping approaches; and 3) a final pilot report. Companies are requested to take an active interest and pilot tree registration within their operations.
- Co-learning pilot on land tenure arrangements: Cocoa expanded under a migratory pattern. Migrant farmers continuously moved into new forested areas, but have now run out of available forest. Existing lands are subject to complicated land tenure arrangements and farmers often don’t have secure land tenure, but a land use right based on the presence of crops. Once removed they risk losing the use right. Hence, little incentive exists to invest in aggressive cocoa replanting, nor do land owners allow this. The CSC already joined a USAID learning pilot and several workshops on the topic have been held. Joint learning through knowledge sharing and events should lead to the development of specific tools, which will need testing on the ground.

Creating resilience and decent living standards through additional livelihoods

In the context of climate change, diversification is a risk reduction strategy that can increase income sources and food security. Diversification provides opportunity for farmers to transform mono-crop and full sun cocoa systems to multi-product commercial systems that increase household and farm resilience against climate shocks. WCF is promoting diversification through its work on ‘additional livelihoods.’ This work seeks to improve farmer resiliency by promoting women empowerment, household food security and additional income through the production of food crops. A clear example of these types of activities from the CLP is the production and transformation of cassava into high

quality cassava flour, pastries and other foods products. Other examples are honeybee keeping, soap making, rearing of 'grasscutters', vegetable production, cocoa nurseries, professional farm service delivery and the transformation of cocoa husk into organic fertilizer. Intercropping cocoa with tree or food crops can be profitable, but comes with additional demand on the farmer's time and financial resources (cost of seedlings, labour, pruning, etc) and entails some risk regarding introducing pests and diseases.

As cocoa farmers rarely rely only on cocoa for their income, the concept of 'living income' (<http://www.sustainablefoodlab.org/performance-measurement/tools-resources/living-income/>) is very useful in discussing additional livelihoods. Sustainable Food Lab uses the following definition: "Living income is the net income a household would need to earn to enable all members of the household to afford a decent standard of living. Elements of a decent standard of living thereby include: food, water, housing, education, health care, transport, clothing and other essential needs including provision for unexpected events." Often only cocoa income is considered when looking at cocoa communities, and key expenses are not always perceived. Living income is a more comprehensive perspective and envisions thriving, economically stable, rural communities linked to global food and agricultural supply chains. The goal is to support activities focused on improving smallholder incomes towards living income benchmarks and enabling smallholder farmers to achieve a decent standard of living.

Potential learning and piloting:

- Pilots and learning on strategies that support activities focused on improving smallholder incomes towards living income benchmarks and enabling smallholder farmers to achieve a decent standard of living.

Youth, gender and intergenerational farming

In West Africa, cocoa is often called an 'old man's crop', which highlights that youth and women often don't have similar levels of access to cocoa resources as older men. Youths are not necessarily interested in cocoa farming as an activity, but are overwhelmingly of the opinion they will likely be in the cocoa 'business' sometime. In the light of climate change, we need youthful and entrepreneurial cocoa farmers to overhaul, rejuvenate and replant cocoa farms. They need to adopt sedentary, sustainable and climate-smart cocoa farming practices which differ significantly from how their parents operate(d). Often the next generation of cocoa farmers do not yet see opportunities to invest in cocoa—or at least with an equitable return on that investment—since the production factors are controlled by older generations that operate under suboptimal farming strategies with low investments and correspondingly low returns.

Still in West Africa, emerging original research shows that third-party mediation in intergenerational farming issues and even formal succession planning may be an important approach to untangling this fundamental deadlock. Parents and children generally do not discuss inheritance and division of family resources until a parent dies, or when that time is near. There is a stringent cultural taboo on the issue which implies that talking about the issue within the family is equated to wishing your parents ill. However, when this conversation is pitched differently by a third party (a cooperative or company extension officer for example) in a safe context as a business discussion on how to design a family business and investment plan, this taboo seems to be overcome relatively easily. This approach aligns well with many of the youth focused new policy directions in Côte d'Ivoire and Ghana.

For instance, under the new forestry codes, younger generations—with the land owner's (often the parent's) permission—can start investing in planting valuable trees that they personally will register, own and benefit from well before they would be transferred land tenure right. If the farm is indeed on parents' or family lands that they expect to inherit, the tree ownership right pre-empts land ownership in a very secure manner. This means tree tenure can be used as a proxy for land tenure.

Such principles are central to developing CSC systems, since it means we can use intergenerational family business planning, including tree tenure and land tenure arrangements, as a tool to engage younger generations up to 20 years earlier. It can allow for rejuvenation of cocoa farming systems when the farm is at the end of its productive cycle, and not only many years later when lands are finally inherited or released upon the death of an elder. Such an approach on relatively secure lands will help

to stabilize more continuously profitable family farming enterprises on existing lands, eliminating the need for expansion. Also, under intergenerational farming scenarios, intensified agroforestry (sedentary, high resilience, high number of trees on farm, intensified cocoa, high productivity and continuous rejuvenation using intensified food crop as temporary shading) makes a lot more sense from a smallholder's risk-averse business point of view. In such scenarios—due to the structured and transparent planning of investments and sharing of the return on investment among family members—educated absentee family members can also more easily play a role in the family enterprise, and either take co-ownership or even sell their share. Forward-thinking traditional leaders may also be highly interested in granting renewals of parents' lands leases to next generations of cocoa farming families who present a clear business plan, as the chief will also benefit when land is used productively and fees are paid yearly.

These arrangements may even create new forms of 'sharecropping'—which have already been witnessed in some cases—that no longer involves splitting the land, but focuses on splitting the profits depending on the monetized investments made by multiple generations investing in multiple plots. These farms may even be put under professional farm management using professional service providers. Another key element in this arrangement will be facilitation and template-provision for contractual arrangements between families. Interventions would need to include a strong communications plan, possibly including community events on family businesses, entrepreneurship in cocoa and succession planning (including theatre, debate, multimedia, and radio), to help break the taboo on the topic of inheritance.

Potential learning and piloting:

- Recent studies suggest much scope exists for third-party mediation (possibly by a company) in intergenerational farm business & succession planning both within families and within traditional jurisdictions.
- Experimentation with the use of land tenure as a soft proxy for land tenure within intergenerational arrangements.
- Experimentation the business case for professional farm management.
- Experimentation with approaches to break the taboo on discussing inheritance of cocoa farms in West-Africa.
- Training of rural youth and women as technical assistance provider to the current cocoa growers via routine visits to observe, analyse and improve decision-making for better management of pests, diseases and weeds and monitor impact of improved decision-making on yield and quality of cocoa (<http://alianza-cac.net/herramienta-cacao/>).

Improving existing climate change predictions

Current climate models predict that growing conditions will become more challenging for cocoa farmers in the coming decades. The most important factor for cocoa productivity is sufficient precipitation throughout the year. The challenge for climate change impact research is to provide reasonably certain predictions despite the uncertainty of precipitation projections from climate simulations. However, there is widespread agreement that dry season temperature increases will raise water requirements for cocoa production in West Africa. Though this would harm cocoa trees even with constant precipitation, climate models also project a longer dry season towards the Savanna. Even in zones where additional rainfall is predicted, such as the interior of the cocoa zone, weather projections suggest that the additional rainfall may come as torrential rain rather than evenly distributed.

While much research has already been conducted on the expected impacts of climate change, there is much we do not know. Little scientific knowledge exists about the effect of heightened growing season temperatures on cocoa quality, quantity and pest and diseases. Further insight into the effects of climatic change on the cocoa tree could come from either large sets of field data or thorough research trials. Existing research on the impacts of climate change for cocoa has largely relied on minimal input data (presence/absence data and interpolated climate data) because little else has been available. Though studying the effects of inter-annual variability requires large datasets of yield and weather data, such data is often not publicly available. This scarcity is a major hurdle that makes the use of modern research tools unfeasible and the subsequent development of effective adaptation difficult.

Understanding more about cocoa physiology will also help to strengthen climate impact predictions. Research trials have largely assumed a constant climate. Where heat and drought effects were researched in controlled experiments, the applied temperature and precipitation ranges were designed

to reflect historically observed climates. The physiological effects of extremely high temperatures in global warming remain to be elucidated. Modern information technology, such as the increasing ease of data collection and analysis using information and communication technology (ICT) tools, provides opportunities to address this research gap. Integration of existing data and open sharing with the research community appears to be a feasible way to develop micro-targeted adaptation tools. Learning from past experiences with pest and disease outbreaks, shade and water management in combination with the use of autonomous and smart (micro) weather stations the communication possibilities of mobile devices may vastly improve our capability to manage novel climate conditions.

Forthcoming work

Climate change impact studies have in the past focused on the sector's largest origin countries. Some have falsely concluded that this was because of the relatively stronger impacts of climate change on the region. In the coming months, additional CGIAR/CIAT studies will focus on cocoa in Central America, South America and Indonesia. In addition, a global impact study will provide a means to compare impacts across regions. The work in West Africa will be amended with data on the economic importance of cocoa in the different impact zones and putative impacts on rural households. Increasingly more importance will be put on context-specific adaptation by providing tailored adaptation plans for various stakeholders and the different impact zones.

Dealing with climate change variability

Research to date has largely focused on long term climate effects rather than the implications of increased inter-annual climate variability. Uncertain weather patterns exacerbate the short-term economic risk for farmers and may make cocoa less attractive. Accessible up-to-date or even real-time weather information is essential for smallholder farmers to make investment decisions. Additional knowledge gaps concern the impact of climate change on actual production. As production and yield data is not easily accessible for public research, it is difficult to assess how much of the region's production is threatened by climatic changes and climate variability. The lack of publicly available longitudinal data and comprehensive knowledge is a key risk to the sector. Thus, while WCF may be able to contain the risk by promoting climate smart practices that manage climate risk with current knowledge, the cocoa sector is unable to truly anticipate coming changes and take proactive action to minimize risks both in the near and further future. The potential to adapt cocoa to increased temperatures and increased precipitation and pest risk remains largely unknown. In forthcoming projects, researchers will move towards a more detailed assessment of the importance of inter-annual variability for climate change risk.

Link to CCAFS infographic:

How farmers around the world are making decisions based on weather and climatic information
(https://ccafs.cgiar.org/sites/default/files/images/CCAFS-Climate_Servies_Infographic-BLOG-final.jpg)

Potential learning and piloting:

- Data integration and public and private (historic) data unlocking on almost all fronts (e.g. cocoa physiology) will improve climate predictions and models, the quality of which are depending on 'big data'.
- Use of early weather warning systems to fine tune crop and pest management and mid-range climate prediction to adjust harvest estimates.
- Improving capacity for foresight analysis at the level of cocoa growing territories to enhance resilience to climate change and variability.
- For the development of climate change impact predictions for Central America in collaboration with the LC, important data contributions have been made, but this can be strengthened.
- Advance climate exposure analysis of the cocoa growing regions of Mesoamerica (being carried out by CIAT) to identify aptitude of cocoa growing landscapes challenged by foreseen changes due to climate change. Follow-up with detailed and precise analysis of plausible CSC actions for each cocoa growing landscape with active participation of key partners.
- Pilots with autonomous (micro) weather stations/services, providing weather information to sector operators large and small, including cost-benefit analysis.
- A more detailed assessment of the importance of inter-annual variability for climate change risk.

Way forward

Based on the ideas presented in this Inception Report and the feedback provided by the stakeholders, from November 2017, National Inception Reports will be elaborated with specific information and guidelines for the target countries.

From November 2017 to June 2018, the key actors of the cocoa sectors of the target countries (united in the Climate Smart Cocoa Strategic Working Groups) will use the inputs from the global and national inception reports to engage in an iterative process to elaborate a sector-wide strategy for addressing climate change impact in cocoa with emphasis on engagement and investment by private and public sector.

Our aim is that key actors of the cocoa sectors of the target countries will use the inputs from this strategy development process to develop pilots and pursue an intensive process of collective learning. With support from the CSC Program, we expect this will lead to the development of short, medium and long-term investment plans. Also be high on the agenda will be embedding and mainstreaming private sector investment plans for CSC into national and regional strategies for increased resilient to climate change and climate variability. We invite any stakeholder to contribute to these goals and join our learning journey.

Annex 1. Commitments of the private sector for cocoa sustainability

			Commitments								Programs & platforms							
Company	Position	Program	Assurance through certification	Assurance through other sustainable sources	Access to finance and risk	Business training and support	Agricultural extension services	Breeding improved varieties	Access to inputs and planting material	R&R, deforestation free supply chain	World Food Life Cycle Database	Cocoa + Forests	Cocoa Livelihoods Program	CocoaAction	Other	Description	Priority location for investment	URL
Barry Callebaut	Trader	Forever Chocolate	X	X	X	X	X		X	X	X	X	X	X		Barry Callebaut is committed to buying 100% of cocoa as well as other ingredients from sustainability programs by 2025. Additional commitments include becoming carbon and forest positive by 2025, as measured by GHG emissions per ton of product and deforestation-free raw materials. Barry Callebaut aims is to increase productivity by improving farming practices through access to training and inputs, replanting support and productivity increases.	Cameroon, Ghana, Ivory Coast, Tanzania, Indonesia, Philippines, Vietnam, Papua New Guinea, Brazil, Costa Rica, Dominican Republic, Ecuador, Mexico, Peru	https://www.barry-callebaut.com/forever-chocolate
Blommer	Processor	Sustainable Origins	X	X		X	X		X	X		X	X	X		Sustainable Origins is focused on helping cocoa farmers become profitable businesses and successfully compete in the cocoa industry through better service delivery and training to farmer cooperatives.	Ivory Coast, Ecuador, Dominican Republic	http://www.blommer.com/sustainable-origins.php
Cargill	Trader / Manufacturer	Cargill Cocoa Promise	X	X	X	X	X		X	X		X	X	X	X	Cocoa Promise is primarily focused on training and tools for farmers to sustain quality and reliable supplies. Awareness building with customers aim at increasing demand for sustainable cocoa	Cameroon, Ghana, Ivory Coast, Indonesia, Brazil	https://www.cargill.com/sustainability/cocoa/sustainable-cocoa
Hershey	Chocolate Manufacturer	Cocoa Sustainability Strategy	X	X	X	X	X		X	X		X	X	X	X	The Hershey Company is committed to buying 100 percent certified and sustainable cocoa by 2020. Hershey is focused on modernization of cocoa farming to increase farmer incomes, attract new and young farmers and improve resilience of cocoa growing communities. Various interventions are undertaken under the banner of their “Learn to Grow” cocoa sustainability program in addition to its CocoaLink program (access to information on sustainable cocoa production practices via mobile technology), additional income generation activities, and a focus on the distribution of higher yielding disease resistant trees to growers across Hershey’s programs.	Ghana, Ivory Coast, Nigeria, Mexico	https://www.thehersheycompany.com/en_us/responsibility/good-business/creating-goodness/cocoa-sustainability.html

Lindt & Sprüngli	Chocolate Maker	Lindt & Sprüngli Farming Program		X		X	X		X			X			X	Lindt focuses on professionalization through a program based on: traceability and farmer organization, training and capacity building for farmer professionalization, farmer investments and community development, verification and continuous improvement. Since the program's founding in 2008, premiums of more than USD 14 million have been paid and over 55,000 farmers participate in Ghana, Ecuador and Madagascar.	Ghana, Madagascar, Ecuador	http://www.lindt-spruengli.com/sustainability/lindt-spruengli-farming-program/
Mars	Brand	Sustainable Cocoa Initiative	X			X		X		X	X	X	X	X	X	Mars is committed to buying 100 per cent certified cocoa by 2020. Also focus on research programs to improve cocoa breeding, farming methods and protection against pests and disease. Target training for farmers on knowledge and technology aimed at achieving triple current yields.	Ghana, Ivory Coast, Indonesia	http://www.mars.com/global/sustainability
Mondelez	Brand	Cocoa Life		X	X	X	X		X	X	X	X	X	X		Cocoa Life's long-term goal is to source all cocoa sustainably, mainly via Cocoa Life, which has a goal to reach over 200,000 cocoa farmers within the cocoa supply chain. Cocoa Life also monitors deforestation by mapping polygons of cocoa farms to overlay on Global Forest Watch maps.	Ghana, Ivory Coast, India, Indonesia, Dominican Republic, Brazil	https://www.cocolife.org/
Nestlé	Brand	Nestlé Cocoa Plan	X			X	X	X	X	X	X	X	X	X		Nestlé Cocoa Plan targets 150,000 tonnes of cocoa sourced through the program by 2018 (out of 400,000 tonnes total). Large focus on improved planting material in Ivory Coast and Ghana. Signatory on "Accelerating Change" Ceres letter.	Ghana, Ivory Coast, Indonesia, Brazil, Ecuador, Mexico, Venezuela	www.nestlecocoa.com
Olam	Trader	Olam Livelihood Charter	X	X	X	X	X	X	X	X		X	X	X		Olam has GHG reduction targets for Olam-operated farms and plantations. For smallholder farmers included in the Olam Livelihood Charter, pursue reduced agricultural vulnerability through implementation of CSA across several crops including cocoa, coffee, and rice.	Cameroon, Ghana, Ivory Coast, Nigeria, Republic of Congo (Brazzaville), Tanzania, Uganda, Gabon, Zambia, Indonesia, Papua New Guinea, Vietnam, Malaysia, Brazil, Colombia, Peru, Chile, Mexico, Argentina	http://olamgroup.com/sustainability/olam-livelihood-charter/
Touton	Trader	Climate-Smart Cocoa	X			X	X		X	X		X	X			Touton is pursuing a program in West Africa called "Professionalization within a Sustainable Landscape", focused on increasing productivity while promoting system resilience and reducing deforestation through landscape governance initiatives. The program targets at least 50,000 farmers, with Touton implementing the farm-level interventions on training, livelihood improvement and developing a financially sustainable incentive mechanism for landscape governance in cocoa. The Forestry Commission will carry out forest restoration and security; biodiversity research, remote-sensing and GIS; and impact analysis of deforestation on regional rainfall patterns among others.	Ghana, Ivory Coast	http://touton.fr/products/cocoa

Annex 2. Corporate typology based on perception of climate change risks and climate change actions

CORPORATE TYPOLOGY		
Front runner		
Major perceived challenges	Donor partnership	NGO partnership
• Limited confidence in credibility of supply chain sustainability programs • Many of the serious challenges facing smallholders are beyond companies' focus as they are still dealing with basic training needs. • Often basic farmer training is not enough without parallel development of inputs supply chains and service providers. • Many opportunities for leveraging premiums for quality that adequately flow upstream through traceable supply chains still exist. • Farmers' risk aversion is an important constraint to smallholder interventions. • Agronomic challenges such as pests and diseases threaten cocoa production and tend to be a forerunning indicator of threats such as climate change. • Planting material that is disease and pest resistant as well as resilient to climate risks such as droughts is important to survive future dry years. • Caution is needed around climate suitability models and how they are applied as they do not necessarily reflect currently observable conditions. • Impossible to know how to target investments to motivated farmers with the means to adopt and drive sustainability practices given myriad complex factors that influence capacity. • Given the risk of cocoa farmers switching their crop entirely, there is a need to focus on income diversification through mixed cropping systems.	• May have only one or two key people at the global level who convene the global sustainability strategy. These individuals are often overwhelmed by the many initiatives. • Greater connection between or leverage and consolidation of existing programs is preferable to new approaches or initiatives.	• Have limited patience with NGO partners. • Want to jump directly to "how" – learning about approaches that work so they can move quickly into action rather than stalling at coordination.
Optimizer		
Major perceived challenges	Donor partnership	NGO partnership
• Deforestation is rising on the corporate agendas, particularly in West Africa. • Challenging to ensure that investments actually reach farmers. • Impossible to mainstream climate resilient supply chains without customers who are willing to shoulder the extra cost. • There is a lot of confusion around climate smart practices and how it varies from classic good agricultural practices and intensification programs. • Convinced that climate change has already started that the industry needs collective action. • Echo that confidence in certification has decreased. Perceive that customers who used to pay for certification are now paying instead of professionalization. • Changing business-as-usual processes to include sustainability reporting and targets throughout the sourcing and IT systems is complex and expensive. • Landscape level challenges appear serious enough (threatening sufficient supply at a sufficient quality level in the mid-term) that companies are beginning to work together to build smallholder climate resilience. • For real and lasting impact, policy and government-level engagement is a prerequisite. Especially true for collective action across landscapes.	• Do not have significant direct incentive to invest in multi-sectoral platforms for more landscape-level approaches. Do not see the business case for why they should be the ones financing these types of approaches. • Long engagements require funds and partners who share the long-term commitment. • Inefficient donor-driven partnerships can be costly undertakings and as a result optimizers can be particular about donor-driven partnerships in which they engage.	• Seek partnerships with those who have direct interest in the issues of health, social equity and food security so that they can focus their expertise on more efficient commodity production. • Favor direct implementation programs that drive their business while also creating better farms and conditions for farmers.

Idealist		
<i>Major perceived challenges</i>	<i>Donor partnership</i>	<i>NGO partnership</i>
• Given capacity constraints, needed to rely on certification as an indicator of impact on producers. However, prefer more intentional investments at origin. • Trade-off between concentrating buying power on a single origin and exposure to risk in case of origin failure (especially for small companies). • A challenge for smallholders is how to manage additional income. Cocoa buyers are not equipped to intervene on all producer needs such as this one. • There is not yet enough exchange of experience, particularly related to supply chain impact, to mainstream sustainable supply chains. • Climate change is inescapable and therefore it arrests the attention of senior management. • Professionalization sometimes at odds with certification: some farmers drop out of verified supply chain programs in favor of selling to those that still pay the certification premiums. • To secure the future of cocoa, producers need to be motivated and willing to professionalize, including also investing in expanding and growing their farm.	• Seek active partners to support the initial producer capacity building phase on-the-ground as well as with funds to subsidize the high up-front costs. • Keen to be market representatives in grounded and active partnerships, not funders.	• Have greater patience with NGOs, as they are reliant on others' knowledge about supply chain issues to understand social and environmental priorities in producer communities.

Late adopter		
<i>Major perceived challenges</i>	<i>Donor partnership</i>	<i>NGO partnership</i>
• Heavy focus on training is still important in the face of aging trees and aging farmers who are not up to date on improved practices and planting material. • Seems to be a delay between when climate change became a problem for producers and when it started to be recognized as a problem by senior management. • In spite of interest in dealing with climate change, budget constraints take priority.	• Beneficial partners when looking to scale up successful initiatives, though normally not as an entry point.	• Do not see value in NGO partnerships for smallholder engagement.

Annex 3. Non-exhaustive summary of Climate Smart Cocoa landscapes in the target countries

Non-exhaustive summary of CSC Program Landscape				
Region or country	Anchor partner(s)	Thematic/strategic working group	Key partners in CSC group	Key programs/initiatives
Central America	Vredeseilanden en Mesoamérica (VECOMA)		Bioversity, CATIE, CIAT, COSUDE, CRS, ECOM, LWR, SICA	Regional knowledge management program for improving competitiveness and sustainability of cocoa sectors of Central America with funding from Swiss Development Cooperation Agency.
Dominican Republic	Nazario Rizek	National Cocoa Commission supported by public and private actors	CONACADO, ECOM, IDIAF, Ministry of Agriculture, Department of Cocoa, Roig Agro-Cacao, UNDP, VALHRONA	
El Salvador	Catholic Relief Service (CRS)	National Cocoa round table (Mesa Nacional de cacao), supported by Cocoa Alliance	APCAPI, CENTA, CLUSA, ES Cacao, Guittard Chocolate, LWR, MAG, UES, VECOMA	- Cocoa Alliance program: Implemented by Catholic Relief Services with funding from Howard Buffet Foundation and USAID to establish cocoa agroforestry systems with 6500 small holders
Honduras	Lutheran World Relief (LWR)	National Cocoa Value Chain Committee supported by the National System for Technical Assistance in Cocoa (SINATEC)	APROCACAHO, Chocolate del Caribe, Chocolate Halba, COPECO, FHIA, FUNDER, PNUD, SAG, UNAH, VECOMA	- APROCACAHO: Cocoa value Chain: Implemented by FUNDER-FHIA-APROCACAHO with funding from the Swiss Agency for Development and Cooperation to foster improved cocoa agroforestry systems with 3000 small holders
Nicaragua	ECOM Agrottrade (ECOM)	National Cocoa Value Chain Commission supported by the Nicaragua Association of Growers and Exporters (APEN)	APEN, Cacao Oro, CANICACAO, CRS, Ingemann, INTA, LWR, MEFCCA, Ritter Sport, Solidaridad, UNA, VECOMA	- PROCACAO: Cocoa value Chain: Implemented by MEFCCA and ONUDI with funding from the Swiss Agency for Development and Cooperation to foster improved cocoa agroforestry systems with 3000 small holders - NICAADAPTA: Implemented by MEFCCA with funding from IFAD and BCIE to benefit 20,000 Cocoa and coffee growers in Caribbean region - PROGRESSA Caribe: Implemented by CRS and LWR with funding from USDA to benefit 3000 cocoa growers in Caribbean region - ADAPTA: Implemented by Ingemann with funding from IDB to benefit 1000 cocoa growers in the north
West Africa	CCAFS/LC		CIAT, IITA, Rainforest Alliance, Root Capital, SFL	- WCF ACI - WCF CLP - IDH/ISU/WCF Cocoa and Forest Initiative - WCF CocoaAction
Côte d'Ivoire	CCC, SEP-REDD, CCC	Thematic Group on Environment and Climate Change, under the PPPP of the CCC	CCC, CNRA, CSC Companies, Ecterra, ICRAF, IDH, Impactum, MINADER, SEP-REDD, SODEFOR, Tranchivoire, UTZ, World Chimpanzee Foundation	- Cocoa Ami de la Forêt (by Conseil Café Cacao) promote sustainable cocoa production, intensification and protection/restoration. - Greening the Cocoa Industry (by RA, GEF, UNEP): Give the industry a more active role in biodiversity conservation and increase smallholder income. - ISLA (by IDH) : a multi-stakeholder coalition on sustainable land management model for balance between production and protection. - Quantity, Quality, Growth" (2QC) (by Conseil Café Cacao) National cocoa production promotion and sustainability program. - The Transboundary Tai-Sapo Corridor Project (by GRASP/UNEP, World Chimpanzee Foundation, GIZ/KfW): to unite and protect forest fragments by promoting agroforestry and PES.

				- The African Cocoa Initiative (ACI-2) (by WCF company members, USAID, governments), PPP on productivity, planting materials, inputs and financial services.
Ghana	COCOBOD, MLNR/FC	Thematic Working Group on Environment and Climate Change, under the to be reinstated Ghana Cocoa Platform	Cocobod (CHED, CRIG R&ME), CSC Companies, Forestry Commission/GhREDD+, IITA, MESTI, Minerals Commission, Ministry of Chieftaincy, MOFA, Mondelez, Proforest, Rainforest Alliance, Solidaridad, World Bank/FIP	- Mainstreaming Climate-Smart Value Chains in Ghana (CCAFS, SFL, RC and RA). - CORIP (by Solidaridad and partners) Cocoa Rehabilitation programme - Ghana Cocoa Forest REDD+ Program (by Cocobod and Forestry Commission) focus on cocoa and landscape management under Emission Reduction Program. - Full Sun to Shaded Cocoa Agro-forestry Systems (SNV and German government) balanced approach to business, cocoa production and forest protection. - Climate Cocoa Partnership for REDD+ Preparation (by OLAM and RA) break the link between cocoa production and deforestation, resilient mixed cocoa systems

Annex 4. Hotspot Intervention Areas - Ghana Cocoa Forest REDD+ Program (GCFRP)

LOCALIZATION OF GHANA'S HIAs (ADMINISTRATIVE DISTRICTS)

