

Conservation Investment Blueprint: Cocoa Smallholder Renovation and Rehabilitation (R&R) Using Climate Smart Practices to Protect the Forest and Improve Local Livelihood

Executive Summary:

Cocoa is a key commodity to the economies of Côte d’Ivoire and Ghana. In both countries, it is associated with numerous challenges such as poverty, child labor, deforestation and increased threats of climate change. Investing in smallholder cocoa farm renovation and rehabilitation (R&R) using climate smart practices can help increase cocoa productivity on agricultural lands, reduce greenhouse-gas emissions, and increase climate resilience while improving income and farmer livelihoods.

This blueprint presents:

- A (blended) value-chain finance approach to unlock smallholder cocoa finance through on-the-ground cocoa operators and a case study illustrating its implementation at small scale;
- An illustration of investment needs at the scale of an operator and ultimately at the scale of Côte d’Ivoire and Ghana;
- A proposed R&R Fund structure and a phased-approach to transition from financing through on-the-ground operators to financing through local financial institutions.

To move forward from piloting and conceptual framework to large scale implementation, this blueprint requires:

- Investments in scaling-up and replicating small scale-transactions on the scale of \$200,000 to \$1,000,000 of grant and debt finance depending on operator;
- Bold leadership from the cocoa sector and the commitment and cooperation of various stakeholders to take reasonable risks and explore innovative approaches.

i. Overview of the conservation need and opportunity

Cocoa is a key commodity in Côte d’Ivoire and Ghana, whose smallholders are responsible for about two-thirds of global cocoa bean production, representing a combined export value of \$5.95B USD (\$3.74B for Côte d’Ivoire and \$2.21B for Ghana)⁽¹⁾. Cocoa provides livelihoods for about a quarter of the two countries’ populations and is important to the national economies, contributing close to 20 percent of GDP in Côte d’Ivoire and 9 percent in Ghana⁽²⁾. Despite its predominance in both country, cocoa culture is associated with many challenges, including but not limited, to extreme poverty, child labor, poor productivity and deforestation.

Extension of cocoa production drives deforestation while climate change is shrinking the suitable zone for cocoa cultivation in both countries and promoting the spread of diseases like the Cocoa Swollen Shoot Virus Disease (CSSV).

Historically, increases in cocoa production have been achieved through expanding the area under cultivation to mine the fertile soil of cleared forests. The growth production has depended on the expansion of cocoa farms into uncultivated land to boost yields rather than shifts in cultivation methods⁽⁴⁾. Between 1988 and 2007, West Africa lost 2.3 million hectares of forest to cocoa cultivation.

By 2050, yearly and monthly minimum and maximum temperatures are predicted to increase by up to 2.0°C⁽⁵⁾. As a result, suitability for current cocoa-growing areas will decrease seriously and climate change will increase pressure on forest areas. Any impact of climate change on the suitability to grow cocoa in West Africa will not only affect farmers’ livelihoods and incomes, but the national economies as well. Measures to help the cocoa sector adapt to climate change are crucial for environmental, social, and economic sustainability.

Scale and scope of activities required to address conservation need/opportunity

Due to continuing demand for cocoa, cocoa production is confronting the triple challenge of 1) increasing productivity on limited land, 2) reducing pressure on forests and ecosystems, and 3) enhancing climate change resilience⁽⁶⁾. Cocoa production can be sustained in most of current cocoa-growing regions by the 2050s with a well-directed adaptation effort and tackling the key challenges in the cocoa sector⁽⁷⁾.

Climate-Smart Cocoa (CSC) Production

Today, governments and companies agree on the need to support smallholders in the improvement of their farm productivity through climate-smart cocoa (CSC) production. As of December 2017, the Governments of Côte d'Ivoire and Ghana and 22 cocoa companies had signed Frameworks for Action under which they commit to promoting sustainable cocoa production, social inclusion, and forest protection⁽⁸⁾. Climate-smart cocoa (CSC) encapsulates three goals: 1) increase the productivity of agricultural lands, 2) reduce greenhouse-gas emissions, and 3) increase climate resilience⁽⁶⁾.

Renovation and Rehabilitation (R&R)

The aging and pest-infected tree stock in West Africa makes the replacement of aging trees (renovation) and the improvement of existing tree stock (rehabilitation), referred to as R&R, an essential element of CSC⁽⁹⁾.

- **Renovation** = Removing old trees and replanting with new trees through underplanting, partial replanting, or complete replanting. Renovation requires upfront investments that deliver (potential) long-term productivity uplifts.
- **Rehabilitation** = Improving existing tree stock through better management and technology, with activities such as grafting and pruning alongside Best Management Practices (BMPs) like pest and disease control, fertilizer management, and soil improvement.
- **Fundamental challenge of smallholder R&R:** As a declining long-term asset, tree crops require maintenance and renewal to maintain yields. Maintenance and especially renewal costs are high upfront followed by a period of reduced returns. With lack of financing, smallholders cannot overcome what has been termed the “valley of death” which is the period of high initial costs followed by little or no financial returns and thus are stuck in declining productivity systems.

Smallholders in Côte d'Ivoire and Ghana harvest about 500-600 kilograms and 400 kilograms of cocoa per hectare, respectively⁽¹⁰⁾. Improved agricultural practices such as CSC and the adoption of R&R practices could more than double the yield to 1,000-1,500 kilograms per hectare.

Table 1: Smallholder cocoa data

	Côte d'Ivoire	Ghana
Number of farmers ²	800,000	800,000
Land under cocoa cultivation (ha) ^{2,4}	2,000,000	1,650,000
Renovation requirements ^{1,4} (ha)	650,000 (≈32%)	720,000 (≈40%)
Rehabilitation requirements ¹ (ha)	1,150,000 (≈57%)	N/A
Average plot size (ha) ^{2,4}	3.3-3.7	2.6
Average yield/ha ²	450	400-500
Total production volume (MT 2015/2016) ³	1,581,000	778,000
% of world production (2015/2016) ³	39%	19%
Average age of trees ^{1,4}	47 years old	23 % of tree stock is over 30 years

Table references:

¹ Dalberg 2015,

² Sector Transformation 2015

³ ICCO 2016

⁴ COCOBOD, 2017

Activities required to support CSC management practices and implement R&R:

Cocoa producers need access to packages including:

- Improved planting materials;
- Quality fertilizer and agro-chemicals;
- Short-term finance to cover working capital needs including access to inputs and contracted labor necessary for certain activities such as replanting, tree pruning or harvesting;
- Long-term/patient finance to cover upfront investment in farm R&R that can only be recovered after several years of production;
- Technical assistance:
 - Training on best management practices (BMPs) and climate-smart cocoa practices;
 - Training on farm level planning, business and financial management;
 - Agronomic services such as soil analysis, technical advice and guidance, etc.

Packages may be delivered through farmers by **on-the-ground operators' service delivery models**. A good example of such model is the service delivery model of ECOM through its subsidiary SMS in Ghana, as presented by IDH: <https://www.idhsustainabletrade.com/uploaded/2016/10/SDM-short-case-report-ECOM-Ghana.pdf>

A non-exhaustive list of cocoa buying companies that may serve as on-the-ground operators:

- Ghana: PBC, ECOM, OLAM, Barry Callebaut, Kuapa Kokoo, Touton, TransRoyal Ghana, Cocoa Arabopa Association, Plot Enterprise
- Côte d'Ivoire: ECOM, OLAM, Barry Callebaut, Cemoi, Ecookim, etc.

Please review example of input loans and technical assistance provided to ECOOKIM in the supplementary Case Study #1: Investing in smallholder cocoa farm R&R with the Union of Cooperatives ECOOKIM, Alterfin and responsAbility in Côte d'Ivoire.

ii. *How the Blueprint contributes to conservation goals*

The adoption of R&R practices in the cocoa sector delivers a suite of ecosystem services including restored tree stocks, restored soil and water retention, reduced fertilizer use, prevented deforestation and reforestation through the addition of shade trees in cocoa systems.

Key Metrics

- **Increased productivity:** by renovating and rehabilitating tree stocks, farm yield progressively increases resulting in increased productivity.
 - Yield uplifts depend on **replanting** conditions, varieties and farm management. Previous programs have shown that farmers can experience yield uplifts from **500 kg/ha to 1.45 tone/ha**, with adequate support ⁽¹¹⁾;
 - Previous programs have shown that smallholder farmer yields can be raised from **500 kg/ha to 1 tone/ha** with well-managed **rehabilitation** programs ⁽¹¹⁾.
- **Increased farm resiliency to climate change and restoration of ecosystems:** by implementing climate smart R&R practices (shade management, crop diversification, intercropping, soil and water management, etc.) farmer become more resilient to climate change;
- **Increased farmer profitability and income from cocoa production** (assuming price can be maintained): by increasing productivity, farmers can generate higher revenue from cocoa; by implementing CSA practices and diversifying production farmers can access new sources of income;
- **Decreased deforestation:** due to intensification rather than extension of plantations.
- **Independent sustainability and origin certification standards**

Standardized Global Impact Investment Network IRIS metrics for social, environmental and financial performance may include (<https://iris.thegiin.org/metrics>):

[Units/Volume Produced \(PI290\)](#) [Units/Volume Sold: Total \(PI263\)](#), [Product/Service Certifications \(PD2756\)](#), [Land Directly Controlled: Sustainably Managed \(OI6912\)](#), [Land Indirectly Controlled: Total](#)

([PI3789](#)), [Biodiversity Assessment \(OI5929\)](#), [Threatened Species Policy \(OI1618\)](#), [Ecosystem Services Provided \(PD8494\)](#), [Type of Land Area \(PD3922\)](#), [Area of Trees Planted: Total \(PI4127\)](#), [Producer Price Premium \(PI1568\)](#), [Units/Volume Purchased at Price Premium \(PI2422\)](#), [Pesticide Use \(OI9891\)](#), [Land Directly Controlled: Treated with Pesticides \(OI2569\)](#), [Area of Land Deforested \(PI1489\)](#), [Ecological Restoration Management Area \(PI9556\)](#).

A CPIC-branded investment blueprint needs to demonstrate clear and measurable impacts on biodiversity conservation. This can happen through interventions that are designed to ameliorate threats to biodiversity, at the species or ecosystem level. Influence over the delivery of ecosystem flows that benefit people is also desirable.

Threats to biodiversity can be assessed at a spatial scale using the Integrated Biodiversity Assessment Tool (<https://ibat-alliance.org>). The first step is to assess what biodiversity assets exist in proximity to project sites using the proximity tool of IBAT. Once threatened species, Key Biodiversity Areas and protected areas in the vicinity of the site are identified, then each of these have listings of threats to biodiversity that can be influenced by the investment opportunity. An example would be the reduction in pollution of biodiversity-rich rivers from investments in reforestation.

A clear statement of the planned reduction in threats to biodiversity that will be generated by the investment is necessary to justify priority status as a CPIC blueprint. In the first stage of project development, a simple assessment of the project proximity to biodiversity asset and the link between the impacts of investment and the reduction of threats is sufficient. Once investment activity is confirmed, a more detailed assessment of potential return on investment for biodiversity is required. A module to calculate this is under development for IBAT. This biodiversity return on investment can be calculated ex-ante, as a means of assessing opportunities for impact, and ex-post, once the investment is confirmed and management starts.

A first assessment of the impacts of the investment on ecosystem services to people can be made through the use of the TESSA tool (<http://tessa.tools>). A more detailed assessment of the tools available for conservation assessments, forest landscape restoration planning landscape assessment generally, and biodiversity management is available in the Conservation Investment Blueprints: A Development Guide available on the CPIC website (<http://cpicfinance.com/related-reports>).

iii. *The business model*

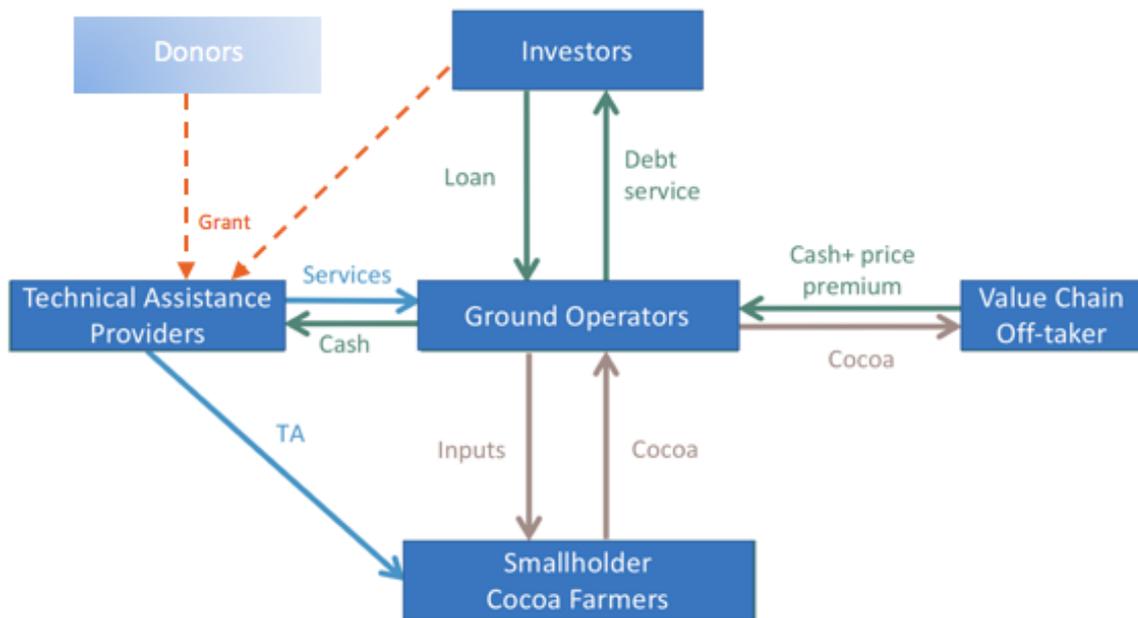
Organisation and governance

R&R packages of products (inputs) and services (technical assistance) are distributed to smallholder cocoa farmers, leveraging cooperative structure or operator's own service delivery model. Cocoa is sourced from farmers and cost of inputs and services are cut on price paid to farmers.

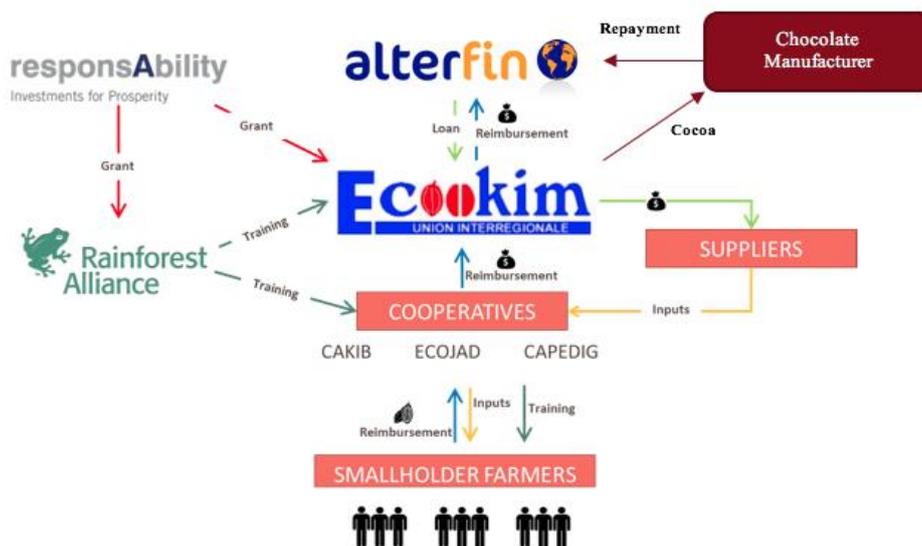
Operator is responsible for managing project level cash flows and to pay back investors based on partnership agreement.

At the farmer level, **project is designed to match farm level cash flows**— considering production cycle of cocoa and “income gap” period associated with replanting. Farmers eligible for long term finance should have a good track record with annual pre-crop finance and demonstrate sound cash flow management.

- **Investors** (blended-finance: public/private/philanthropic)
- **Value Chain Off-Taker** (Cocoa buyer/processor/manufacturer)
- **Smallholder Cocoa Farmers**
- **Technical Assistance Providers**
- **Ground Operators** (input suppliers, farmer organization with export license or affiliate, national cocoa agencies) – Please see list in previous section.
 - In the Case Study in Ghana, it is noteworthy to highlight the omnipresent role of COCOBOD in the Ghanaian cocoa value chain, where all cocoa produced in Ghana is transacted through COCOBOD's marketing company (CMC) before being exported, which may require the business model to go through COCOBOD.



Please review governance structure in the supplementary Case Study #1: Investing in smallholder cocoa farm R&R with the Union of Cooperatives ECOOKIM, Alterfin and responsAbility in Côte d'Ivoire.



Comprehensive segmentation of farmers to **identify farmers who offer the strongest potential for commitment** over a long-term period to achieve the desired impact and repay R&R loans. Examples of segmentation criteria:

- Farm size: minimum number of ha under cocoa cultivation;
- Farmer profile: young farmers with farmers with entrepreneurial min-set;

Climate change: select areas where climate is most suitable to renovation to the medium to long-term (vs diversification out of cocoa).

Products and services being sold

Sustainable Cocoa – Certified

Cash flows and commercial sustainability

Transaction Revenue Model

- Ground operator generates revenue by buying and selling cocoa;
- Ground operator pays interest on debt to lenders.

External dependencies

The business model relies on the following pre-conditions:

- **Sector Governance:** The cocoa sector is well governed locally. Local governments are creating the right conditions for the sector to function.
- **Land Rights and land tenure:** Farmer access to adequate forms of **land ownership and land titling** (present land rights may be a disincentive to replantation);
- **Access to Inputs:** Farmer/operator **access to planting material and inputs** controlled by government agencies (Conseil Café Cacao, COCOBOD);
- **Access to Labor:** Farmer has access to labor he/she can employ for specific farming activities (local labor or immigration).
- **Farmer Access to Government-based and company-based technical assistance:** Farmer/operator access to technical assistance services controlled by government agencies (Conseil Café Cacao, COCOBOD) and buying companies;
- **Price Floor Regulation:** Farmer access to **minimum farmer-price set by government**;
- **Compensation to farmers** during the early years.

Risk management

The following approaches may be used to reduce operational and financial risks:

- Definition of **technical packages** to support R&R activities at farm level (types, volumes and costs of products and services to be delivered to farmers) and **segmentation of farmers** to identify those with the strongest potential to achieve the desired impact and repay packages.
- **Design smallholder finance model**, including: the articulation of R&R packages as R&R loan products for farmers, the definition of loan requirements & repayment terms, the development of tools and methodologies to manage credit at farm level, engagement with local financial institutions to support the program, etc.
- **Identify relevant actors and intermediaries to deliver financing** to farmers through existing or new multi-sectoral partnerships involving export companies, cooperatives, input suppliers, local financial institutions (banks and MFIs), government agencies, extension service providers (NGOs), etc.
- **Secure “Off-taking” Agreement** as part of the project structure.
- If possible, **spread risk** of R&R cocoa program across operators’ business lines (e.g. other commodities).

iv. The investment model

The financial instruments being sought to fund the business model

Blended financing including debts and grants for short term financing of inputs and long-term financing of capital improvements (renovation finance).

Examples of proposed blended finance vehicles to unlock investment in smallholder cocoa in Ghana ⁽¹²⁾:

1.A COCOBOD Collective Finance Solution	<ul style="list-style-type: none"> A new long-term revolving investment facility (5 years' tenor) is set up alongside COCOBOD's existing Syndicated Pre-Export Finance Facility. Financing is based on the credit worthiness of COCOBOD together with a guarantee from the Ghanaian government or other governmental institutions; Proceeds of the facility are used directly by COCOBOD or through PPPs to deliver CSA training, inputs and services to farmers; Repayment to the facility is secured by COCOBOD on the spread between farm-gate price and net FOB price margin (the entire cocoa sector collectively contributes to the repayment of the facility)
1.B COCOBOD Targeted Finance Solution	<ul style="list-style-type: none"> A new long-term revolving investment facility (5 years' tenor) is set up alongside the existing Syndicated Pre-Export Finance Facility. Financing is based on the credit worthiness of COCOBOD together with a guarantee from the Ghanaian government or other governmental institutions; Proceeds of the facility are used directly by COCOBOD or through PPPs to deliver CSA training, inputs and services to farmers; Repayments to the facility derive from "in kind" payments (cocoa deliveries) from individual farmers who participate in the program and enter into a loan with a COCOBOD entity.
2.A Dedicated CSA/R&R Fund for the Cocoa Sector	<ul style="list-style-type: none"> A new long-term revolving fund with 7-15 year financing commitments is set up to pool together public and private sector capital in layered capital structure and possibly a technical assistance facility; Proceeds from the fund are used for direct investment in CSA/R&R projects led by private sector stakeholders (input providers, LBCs/collectors/processors, agribusinesses, farmer based organizations, etc.) Repayments to the facility derive directly from projects managed by investees.
2.B CSA/R&R Cocoa Portfolio Within Existing Funds	<ul style="list-style-type: none"> Direct investments into projects are made by existing impact funds with mandate to invest in the agriculture, conservation or development space globally or regionally; Existing funds dedicate portion of their portfolios to direct investment in CSA/R&R projects led by private sector stakeholders (input providers, LBCs/collectors/processors, agribusinesses, farmer based organizations, etc.) Repayments to the funds derive directly from projects managed by investees.

The relative size of these instruments and basic information on their terms

Investment structure requires long term financing commitments with a **minimum 7 to 15-year range**, in line with the repayment period associated with replantation. In order to finance successive parcels of a cocoa field in a staggered approach, the investment structure may operate as a **revolving facility**; thereby requiring a longer duration than the minimum financing commitment to achieve its objectives. The structure pools together **public and private sector capital in layered capital structure** (commercial to concessional capital with various risk/return profiles). **Estimated R&R Financing at scale (not accounting for capacity building and technical assistance / investment only)** ⁽¹³⁾.

Summary Table:

Investment Level	Project Level	Ghana	Côte d'Ivoire
# Farmers	10,000	177,000	215,000
# Hectares	28,000 Ha	495,000 Ha (assuming 30% of serviceable market)	600,000 Ha (assuming 30% of serviceable market)
Grant for capacity building	Dependent on investment and project structure	Dependent on investment and project structure	Dependent on investment and project structure
Estimated Capital Investment Needs	\$22,000,000 over a 15-year period	≈ \$400 million over a 15-year period	≈ \$480 million over a 15-year period

Assumptions:

1. Farm Management:

- Average farm size of 2.8 ha;
- Farm considered over-aged when majority of trees reach 15 years;
- Targeted farm tree density of 1,111 plants/ ha;
- Implementation of GAPs and application of agrochemicals according to predicted climate impacts;
- Replanted trees are using current hybrid variety and reach max. productivity of 1,180 kg/ha in Year 10;
- Rehabilitated trees reach a max productivity of 762 kg/ha in Year 10;
- Farm household accounts for 69% of farm labor = only 31% is paid for;
- Farmer has no other income that is accounted for in the settings.

2. Farm Financing:

- All cocoa expenses (except family labor) and the negative income period are covered by financing;
- Annual disbursement and repayment according to farm's financing needs and repayment capacity;
- Proportionate repayments equal 80% of additional farm net income vs baseline over time;
- Interest rate charged of 10% (interest rate paid annually on remaining principal and unpaid interest);
- Grace period equivalent to the duration of the negative income period.

3. Economic Indicators:

- Stable price conditions throughout the years (input and output prices)
- Cocoa farm-gate price 1,723 USD/MT (Ghana light season price) – No certification premium
- Discount rate of 15%

R&R Intervention Models:

	TYPE A	TYPE B	TYPE C
Farm Situation	Farms affected by Swollen Shoot	Farms with majority of trees >15-year-old	Farms with majority of trees <15-year-old
% of Farms in West Africa (based on WCF estimates and modeling)	10%	36%	54%
Proposed Intervention	Replanting of all trees on the farm (100%) over a 4-year period	Replanting of trees >15-year-old (over a 4 year period) + Rehabilitation	Replanting of trees >15-year-old (over a 4-year period) + Rehabilitation

Farm Level:

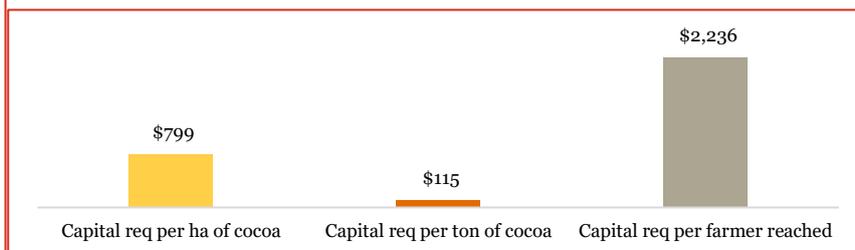
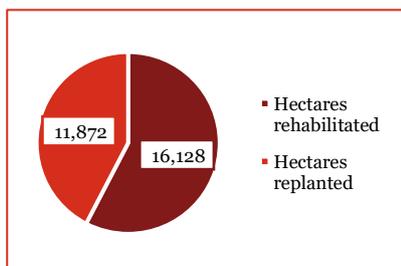
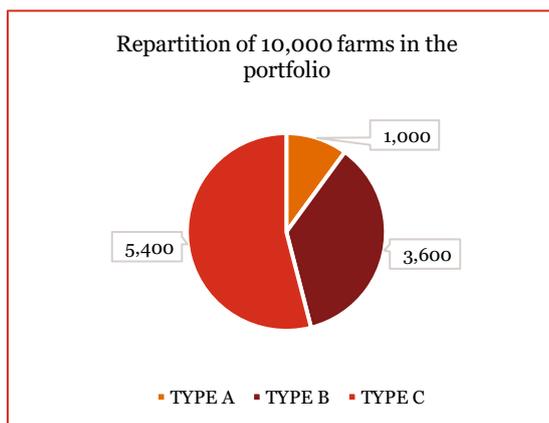
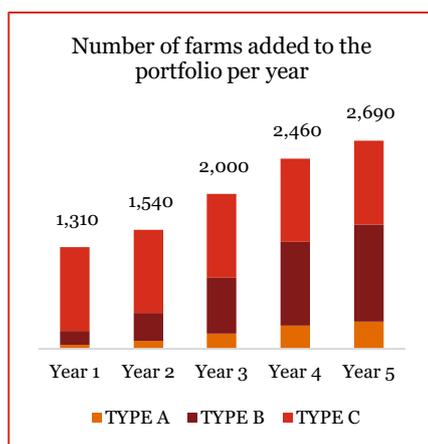
<i>Intervention</i>	<i>Farms affected by swollen shoot (TYPE A)</i>	<i>Farms with majority of trees >15 years (TYPE B)</i>	<i>Farms with majority of trees <15 years (TYPE C)</i>
Total 10Y Revenue	\$23,661	\$25,659	\$27,658
Total 10Y Costs	\$(11,114)	\$(11,296)	\$(11,479)
Total 10Y Net Income	\$12,547	\$14,363	\$16,179
Total Negative Income Gap	\$(5,994)	\$(3,901)	\$(1,832)
Negative Income Period	4	4	3
Project NPV	\$187	\$1,715	\$3,611
Project IRR	16%	25%	45%
Loan Amount	\$5,994	\$3,901	\$1,832
Loan Duration (Years)	11	10	8
Total Repayment	\$10,768	\$6,911	\$2,913

Portfolio level:

10,000 farmers affiliated to one operator (based on Cocoa Action companies' portfolio of smallholders and adequate project size¹) or **28,000 ha** => **Capital required for investment ≈ \$22,000,000 over a 15-year period.**

Outputs

Amount of capital required, (\$000s)	\$22,358
Year of maximum exposure	6
Total number Ha (ha)	28,000
Cumulative supply (tons)	193,578
Weighted average loan size (\$)	\$(3,076)



Size of investment needs at the scale of Ghana and Côte d'Ivoire.

In Ghana:

1,650,000 ha under cocoa cultivation.

Assuming a serviceable market of 30% => Capital required for investment ≈ **\$400 million over a 15-year period** (debt finance with 10% interest rate charged to farmers- interest rate paid annually on remaining principal and unpaid interest).

Outputs

Amount of capital required, \$000s:	\$395,263	Ha rehabilitated:	285,120
Year of maximum exposure:	6	Ha replanted:	209,880
Gross IRR, %:	10%	Capital req per ha:	\$799
Total number of loans made:	176,786	Capital req per ton:	\$116
Weighted average loan size, USD:	\$(2,993)	Capital req per farmer:	\$2,236

In Côte d'Ivoire:

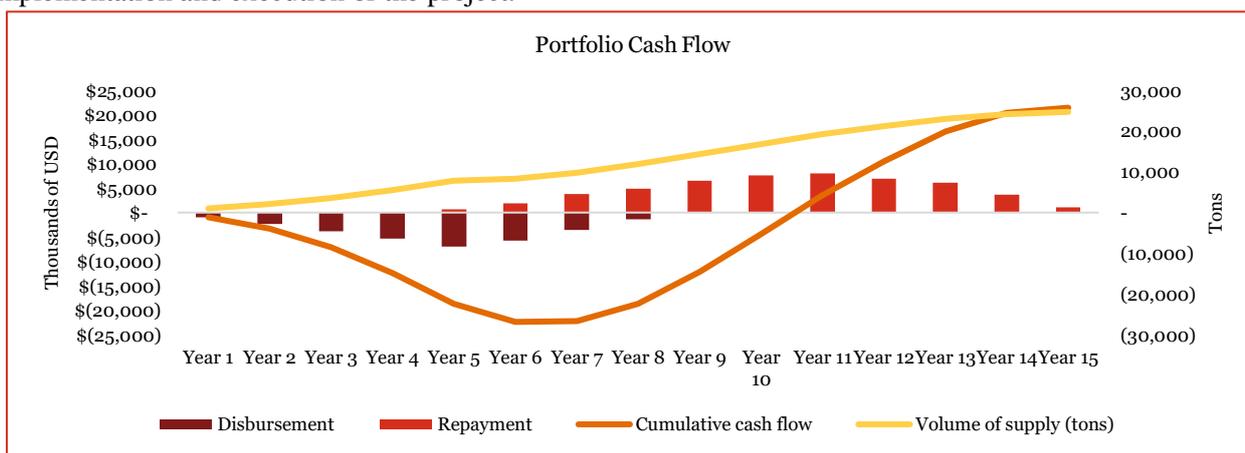
2,000,000 ha under cocoa cultivation.

Assuming a serviceable market of 30% => Capital required for investment \approx **\$480 million over a 15-year period** (debt finance with 10% interest rate charged to farmers- interest rate paid annually on remaining principal and unpaid interest).

Outputs			
Amount of capital required, \$000s:	\$ 479,106	Ha rehabilitated:	345,600
Year of maximum exposure:	6	Ha replanted:	254,400
Gross IRR, %:	10%	Capital req per ha:	\$ 799
Total number of loans made:	214,286	Capital req per ton:	\$ 116
Weighted average loan size, USD:	\$ (2,993)	Capital req per farmer:	\$ 2,236

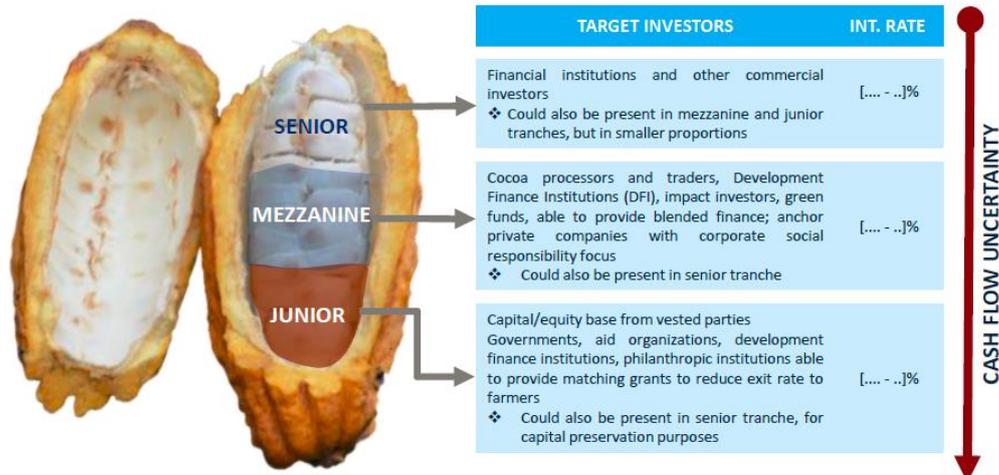
Adding-up technical assistance:

The above analysis doesn't account for the cost of the technical assistance needed to support the implementation and execution of the project.



Investor types and the finance they provide at different stages of project maturity

Possible fund structure (proposed by the IFC):

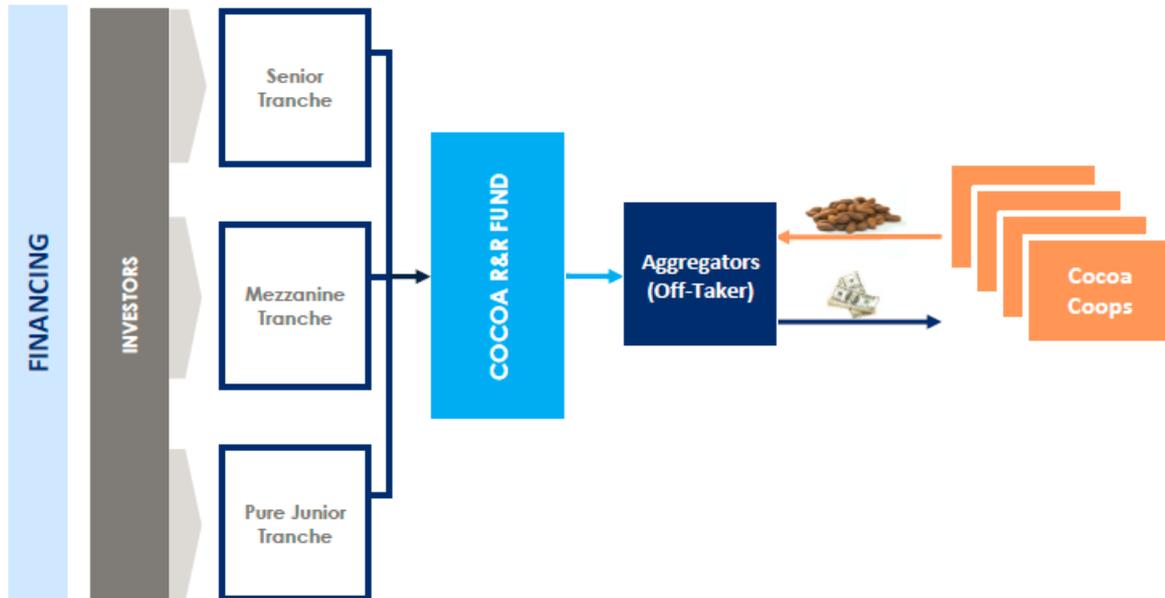


Cash flows are more uncertain as you go down the tranches. Investors in the senior tranche are remunerated first, then the mezzanine, and finally the junior.

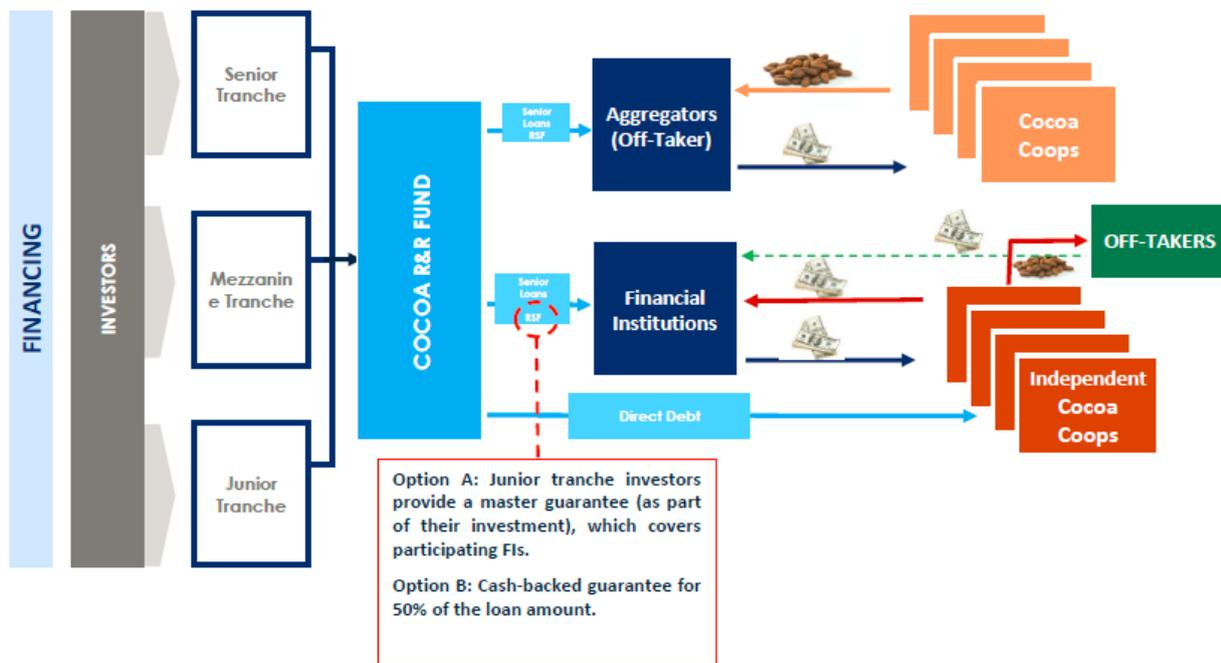
Financing Structure (proposed by the IFC):

Phase 0: Technical Assistance only

Phase 1: Financing provided through aggregators/off-takers



Phase 2: Financing provided through both aggregators/off-takers and financial institutions



Risk mitigation instruments used and how these were incorporated into the investment structure

Possible mechanisms may include:

- A **technical assistance facility** (grant funded) along-side the investment facility to support project readiness and capacity building activities.

- A **guarantee facility** to mitigate against a specific risk (e.g. FX risks).
- A **crop reserve fund**, whereby farmers deposit a certain amount on a deposit account.
- Project specific/additional donor funding.
- 1st-loss capital fund.
- Program Related Investment (PRI)- Guarantee.
- Climate Risk Insurance.
- Risk sharing facility across a number of actors in the value chain (farmers, lenders, cooperatives, input providers, off-takers/cocoa bean purchasers, exporters/processors, and branded chocolate makers).

The exit strategy employed

- Exit Strategy will be when the original loan is repaid based on the long-term investment.
- Potential for loans to be traded on a secondary market which would allow the investor to exit earlier than the loan terms.
- New loan generation would be needed either from new impact investors or original investors deciding to re-invest in order for operations to continue.

Innovative features of the investment model

The proposed model is innovative in a number of respects—scale (the magnitude of the problem is huge), location (never tried in West Africa), and unique blended facility (never done before, blending patient capital with commercial lending in Africa). The approach would need to also look at alternative guarantees, risk-sharing, and collateral across all the actors—input providers, buyers, cooperatives, farmer producer groups, and branded companies and the government regulators.

Replicability and Scalability

Once loan structured has been worked out and template in place, will be easier to replicate this model to delve deeper into the cocoa market as well as use similar template to expand into remaining tree-crop markets.

This R&R blueprint is based on smallholder cocoa farming in West Africa and could be replicated (or adapted) renovate other smallholder cultivated tree crops such as coffee and palm oil in Latin America and Asia.

The model and proposed investment structure are based on the financing of small-scale farmers who are in needs of implementing new farming practices (in this case renovation and rehabilitation of cocoa plantation) to sustain production and adapt to externalities such as climate change BUT are face with low to negative cash flow when making the change.

Existing transactions in the coffee sector (from USAID/Sustainable Coffee Challenge/Dalberg Study):

- ECOM/IFC/IDB/Starbuck facility in Nicaragua (\$30m over 2011-2015 period)
- Coffee Farmer Resiliency Initiative – Root Capital (\$7.7m over 2014-2016 period)
- Columbian government program (\$600m over 2008-2014 period)

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13. Based on cost and benefit analysis conducted the Rainforest Alliance and CCAFS partners in Ghana in 2017. Data collected via a 300-smallholder farmer survey conducted by IITA in January 2017 (Ghana). Assumptions are consistent with the World Cocoa Foundation Cocoa Action's Farmer Economic Model.