Executive Summary

Sustainably improving cocoa farm productivity is critical to Côte d’Ivoire’s economic development, peace and prosperity. To improve productivity, Côte d’Ivoire’s aging and underperforming cocoa tree stock must be rejuvenated through renovation and rehabilitation (R&R). These improvements are essential to preserving biodiversity, improving rural livelihoods and increasing cocoa supply. For such improvements to have impact and scale, there is a need for a market-based solution based on shared values where farmers, the industry and investors can support and financially participate in cocoa farm renovation and rehabilitation practices.

During our three-month Phase 1 Feasibility Study, the Rainforest Alliance produced a flexible and robust investment decision-making tool based on farm-level economics that shows the cost and benefits of implementing cocoa farm R&R practices. This analysis shows that investment loans for cocoa farm R&R are possible with no loss of income to the farmers and can be repaid through the resulting increase in productivity and revenue. With the use of this tool, development professionals, investors, lenders and cocoa industry stakeholders in Côte d’Ivoire can better understand the investment required and discuss opportunities for the implementation of a large-scale investment loan vehicle for intervention.

This project is Phase 1 of a potential long-term project to increase access to finance for cocoa farmers in Côte d’Ivoire and West Africa by the Rainforest Alliance Sustainable Finance Initiative. Future phases of the project aim to design and test loan delivery mechanisms, conduct a pilot investment and develop and fund an investment vehicle.

Background

Problem: Need for sustainable productivity improvements

Despite its historical role as the largest exporter of cocoa in the world—accounting for 34% of total world supply—Côte d’Ivoire has seen its cocoa industry suffering over the past decades.1 Most of the 1 million cocoa farmers present in Côte d’Ivoire and part of the 6 million people relying on the cocoa industry for a living (28% of the population) are living below the poverty line.2, 3 Cocoa yields, already some of the lowest in world, are declining mainly because cocoa trees are old and in need of replacement, soils are deteriorating and diseases such as the Cocoa Swollen Shoot Virus (CSSV) are spreading.4 Losses in productivity and consistent low income among farmers have created tension along the cocoa value chain as producers, traders and cocoa manufacturers worry about global shortages.

While Rainforest Alliance Certified™ farms have demonstrated, in independent studies, to produce more cocoa per hectare than non-certified farms, applying the practices promoted by certification is not enough to prevent the overall diminishing

1. FAO. FAOSTAT. 2013
2. The national poverty line used is about US$1.50 per day depending on the exchange rate.
The Rainforest Alliance in Côte d’Ivoire

The Rainforest Alliance, through its local business consulting partner, the Centre d’Education, Formation, Conseils, Audits (CEFCA), has worked in Côte d’Ivoire since 2006 to encourage cocoa farmers to implement sustainable agricultural practices that promote (a) efficient and productive agriculture, (b) biodiversity conservation and (c) sustainable community development – according to the Sustainable Agriculture Network (SAN) standard.5 As of September 2013, 96,000 cocoa farmers cultivating 474,000 hectares have met the strict ecological, social and economic criteria of the SAN and have become Rainforest Alliance Certified™ farmers.6 In 2012, these cocoa farmers have provided about 300,000 tons of certified cocoa to the market or 10% of world supply.

There is a critical and immediate need for implementing holistic farm renovation4 and rehabilitation7 (R&R) across Côte d’Ivoire to progressively rejuvenate the cocoa landscape and improve cocoa productivity in a sustainable manner.

Solution: A holistic cocoa farm improvement approach

To address these challenges, the Rainforest Alliance in conjunction with Mars Incorporated developed the Sustainable Yield Module (SYM), a detailed set of best farm management, R&R practices designed to improve productivity through techniques consistent with the Sustainable Agriculture Standard.10 Through this model, the Rainforest Alliance aims to offer a comprehensive agronomic intervention package to cocoa farmers in Côte d’Ivoire including:

- Agronomic training on best agricultural practices and farm management (SYM);
- Rainforest Alliance audit and certification;
- Access to finance for training, agronomic services and cocoa farm inputs (including planting materials, chemical inputs and biocides).

This cocoa farm package would offer a transformational solution to farmers, the cocoa industry and to Côte d’Ivoire at large. Cocoa farm R&R implies increased productivity and supply to traders and manufacturers but also improved farmer livelihood, diminished deforestation and preserved biodiversity.

At present, a pilot test of the Rainforest Alliance SYM approach is underway in Côte d’Ivoire, with grant funding and operational support from Mars, the Sustainable Trade Initiative (IDH), Olam International, Barry Callebaut and Cémoi. For such a program to scale and impact the industry however, there is a need to implement a market-based solution that incentivizes a wide variety stakeholders.

This raises the question: What is the economic feasibility of financing cocoa sustainability and productivity improvements in Côte d’Ivoire?

To answer this question, the Rainforest Alliance’s Sustainable Finance Initiative commissioned an independent consultant to conduct a three-month on-the-ground study to:

- Better understand the short- and long-term financial costs and benefits of the SYM at the farmer level, and;
- Assess the repayment ability and potential structures for financing the SYM with a long-term investment loan.

Methodology

The three-month Phase 1 project entailed the following three activities:

1. Desk research and expert interviews;
2. Field visits, data collection and stakeholder meetings, and;
3. Data analysis, financial modeling and tool development.

The consultant interviewed the project’s Expert Advisory Committee (see Acknowledgements below) as well as cocoa industry and agriculture financing experts from 15 organizations actively involved in the cocoa industry in Côte d’Ivoire (including cocoa traders, social lenders, development finance organizations and cocoa program implementing partners). The consultant also visited Côte d’Ivoire to collect data from local cocoa experts and industry stakeholders and to interview Rainforest Alliance Certified™ and non-certified cocoa farmers trained on SYM. The 32 farmer surveys included a basic farmer profile and information about the farmers’ perception regarding the benefits of implementing R&R practices and the costs associated with the implementation of SYM.

Financial Model Design

Based on the data collected, an analytical tool was developed to:

- Assess the costs and benefits of specific farm R&R projects under different on-the-ground scenarios;

8. Renovation refers to the planting of news trees (replanting) and/or grafting (grafting is currently restricted in Côte d’Ivoire) plus the implementation of Best Agricultural Practices (BAP) and the use of chemical or biological inputs when necessary.
9. Rehabilitation refers to the implementation of BAP and the use of chemical or biological inputs when necessary.
Sample of Underlying Variables

Agronomic information
• Planting material information;
• Projected yield information for newly planted trees, grafted trees and rehabilitated trees;
• Chemical and non-chemical input information.

Pricing information
• Agronomic training costs;
• Estimated labor remuneration;
• Certification and audit costs;
• Chemical input market costs;
• Planting material costs.

• Determine under which conditions an investment loan could be paid off through the implementation of the project considered, and;
• Enable discussion between investors, lenders, development professionals and cocoa industry stakeholders on the creation of an investment loan vehicle for cocoa farm sustainability and productivity improvements.

The tool was designed at the farm level, allowing a wide range of variables and scenarios to be considered and, as such, to embrace the diversity of cocoa farms present in Côte d’Ivoire.

The tool relies on a set of underlying agronomic and financial variables that were collected on the ground as well as through literature review. To ensure model accuracy, the Rainforest Alliance, in consultation with cocoa experts, will update and refine these underlying variables on a regular basis.

A Three-Step Approach

The tool follows a three-step approach to assess investment feasibility for a farm R&R project:
1. Project planning;
2. Loan analysis, and;
3. Loan impact assessment.

Step 1: Project Planning

Achieving costs and benefits balance

Under the Project Planning portion of the tool, a qualified SYM project planner—or cocoa technician—will work with an individual farmer to design the most cost effective R&R project. The SYM project planner will (a) enter information specific to the farm considered, (b) define R&R objectives and (c) determine an implementation schedule.

Based on the variables entered into the model, the SYM project planner will be given:
• The amount of financing needed for a specific cocoa farm R&R project, and;
• The project’s cash flow projections and expected economic benefits to the farmer-- assuming it is financed and implemented.

Minimizing costs – maximizing benefits

The tool shows that it is possible to minimize the cost associated with a farm transformation project by using a mix of R&R techniques along with a thoughtful implementation schedule. For example, projects can involve a mix of replanting, grafting (currently prohibited) and rehabilitation techniques, implemented at different rates, over a series of years.

By using a mixed approach and a professionally planned implementation schedule, farmers can see their production from rehabilitated trees increase in a few months while still waiting for newly planted trees to start producing cocoa --which take an average of 18 months to appear after planting--and therefore realize some economic benefit early on.

Usually, when replanting is considered, the longer the implementation period, the lower the project cost. For example, a replanting project implemented over a five-year period will be more expensive than the same project implemented over a ten-year period.

<table>
<thead>
<tr>
<th>Project Objectives</th>
<th>% Farm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rehabilitation</td>
<td>30%</td>
</tr>
<tr>
<td>Replanting</td>
<td>70%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Table 1**

R&R project plan example

<table>
<thead>
<tr>
<th>Replanting schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y1</td>
</tr>
<tr>
<td>10%</td>
</tr>
</tbody>
</table>
od, but also return faster results.

Whereas, farm transformation projects are often costly and associated with loss in income during the early years, thereby discouraging their adoption by farmers, the tool allows project planners to evaluate scenarios that balance the total financial needs of a farm transformation project with its economic impact over time.

Risk mitigation

The tool can also be used to isolate specific risk factors, allowing for appropriate risk mitigation tools and techniques to be considered. For example, the effects of changes in cocoa prices, yields, input prices, etc. can be altered to understand their potential impact on the total project cost and loan repayment ability.

Financing need projection

Once the project plan is decided, the tool estimates the financing needed for the implementation of the project considered. For example, most 3-ha farms (the average cocoa farm size in Côte d’Ivoire) require between $1,000 to $4,000 investment over a two to five year period, depending on the farm initial conditions, the techniques employed and the schedule considered.

This investment accounts for the entire SYM package including chemical inputs, biocides, planting material, additional labor necessary to implement the project, agronomic training and best agricultural practices as well as Rainforest Alliance certification and certification audit costs. If desired, costs for insurance, or additional related goods and services can also be financed. If available, grant funding can be used to offset the investment required.

Finally, the tool also shows the project’s cash flow projections and expected farm benefits including expected increase in yield (Figure 2) and expected increase in economic benefits over the next ten years (Figure 3). These data are critical for a loan officer to determine if an investment loan could be paid off during the implementation of the project considered.

Step 2: Loan Analysis

Matching projects and loan cash flows

Under the Loan Analysis portion of the tool, a potential lender—or loan officer—will work downstream to the SYM project planner to design a long-term loan suitable to the investment needs and projected cash flow of the project considered.

The loan officer will enter specific loan term variables including duration, interest rate and repayment options specific to the project considered.

Because the Project Planning section of the tool

<table>
<thead>
<tr>
<th>Loan Analysis Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>To be entered by lender</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Loan terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Loan size;</td>
</tr>
<tr>
<td>• Lender interest rate and administration fees;</td>
</tr>
<tr>
<td>• Disbursement schedule;</td>
</tr>
<tr>
<td>• Repayment terms (as % of cocoa revenues during high and low season or a fixed amount).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Proposed terms for cocoa farm investment loans:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Grace period long enough to postpone loan repayment when R&amp;R project becomes cash-flow positive;</td>
</tr>
<tr>
<td>• Biannual repayments in line with cocoa harvest cycle during high and low harvesting season;</td>
</tr>
<tr>
<td>• Repayment proportional to incremental revenues generated by the R&amp;R project.</td>
</tr>
</tbody>
</table>

12. Additional labor includes paying for professional services (such as spraying pesticides) and for hiring permanent and/or temporary workers when necessary.
13. Any investor or lending organization willing to lend to farmers, directly or through an intermediary.
provides projected cash flow, it allows the loan officer to plan the repayment schedule accordingly. For example, the lender could decide to collect a significant portion of the revenue early on or collect a modest amount until a threshold of revenue has been realized, depending on their return and impact objectives.

**Investment recommendation**

The tool only recommends projects for investment that have positive Net Present Value (NPV) and Internal Rates of Return (IRR) based on flexible investment assumptions and objectives. Projects that cannot be financed through long-term loans either because the R&R objectives or scheduling considered are inappropriate and/or because the project cash flows are too low to ensure loan repayments may be redesigned, grant funded, self-funded or not performed.

Once finalized, the R&R schedule and details, the loan amount, terms and repayment schedule can be used for documentation, implementation and monitoring purposes, and shared with the farmer and relevant parties (Figure 5).

**Step 3: Loan Impact Assessment**

Under the Loan Impact Assessment portion of the tool, cocoa farmers, investors, traders and development professionals can assess the economic benefits associated with a cocoa farm transformation investment.

The tool demonstrates that recommended investment loans for cocoa farm R&R result in significant social, economic and environmental impacts including:
- Increased sustainable yield;
- Increased trade supply, and;
- Increased farmer revenues.

**Increase in sustainable yield**

Depending on the R&R techniques implemented average farm yields are expected to increase from a low 260–600 kg/ha range to a 1,000 to 1,500 kg/ha range over 10 years.

<table>
<thead>
<tr>
<th>Year</th>
<th>0.4 t/ha</th>
<th>Baseline</th>
<th>0.8 t/ha</th>
<th>1 t/ha</th>
<th>1.5 t/ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>-2,000</td>
<td>-1,000</td>
<td>0</td>
<td>1,000</td>
<td>2,000</td>
</tr>
<tr>
<td>Year 2</td>
<td>1,500</td>
<td>1,680</td>
<td>1,800</td>
<td>1,920</td>
<td></td>
</tr>
<tr>
<td>Year 3</td>
<td>3,120</td>
<td>3,360</td>
<td>3,600</td>
<td>3,840</td>
<td></td>
</tr>
<tr>
<td>Year 4</td>
<td>3,900</td>
<td>4,200</td>
<td>4,500</td>
<td>4,800</td>
<td></td>
</tr>
<tr>
<td>Year 5</td>
<td>5,850</td>
<td>6,300</td>
<td>6,750</td>
<td>7,200</td>
<td></td>
</tr>
<tr>
<td>Year 6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Year 7</td>
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<tr>
<td>Year 8</td>
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<tr>
<td>Year 9</td>
<td></td>
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<tr>
<td>Year 10</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**Increase in trade supply**

Such increases in yields translate into higher availability of cocoa supply to commodity traders and cocoa manufacturers without extending the total size of cocoa cultivation area in Côte d’Ivoire (a major cause of deforestation in Côte d’Ivoire.)

**Increase in farmer revenues**

Ultimately, this results in higher revenues to smallholder farmers who are paid for higher volumes.

<table>
<thead>
<tr>
<th>Guaranteed price to farmers (USD/kg)</th>
<th>Revenues</th>
<th>$1.3</th>
<th>$1.4</th>
<th>$1.5</th>
<th>$1.6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenues</td>
<td>Baseline</td>
<td>520</td>
<td>560</td>
<td>600</td>
<td>640</td>
</tr>
<tr>
<td>Supply (tonnes)</td>
<td>1.2</td>
<td>1,560</td>
<td>1,680</td>
<td>1,800</td>
<td>1,920</td>
</tr>
<tr>
<td></td>
<td>2.4</td>
<td>3,120</td>
<td>3,360</td>
<td>3,600</td>
<td>3,840</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>3,900</td>
<td>4,200</td>
<td>4,500</td>
<td>4,800</td>
</tr>
<tr>
<td></td>
<td>4.5</td>
<td>5,850</td>
<td>6,300</td>
<td>6,750</td>
<td>7,200</td>
</tr>
</tbody>
</table>

**Guaranteed Price to Farmers (USD)**

<table>
<thead>
<tr>
<th>Yields (tonnes)</th>
<th>1.3</th>
<th>1.4</th>
<th>1.5</th>
<th>1.6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2 tonnes</td>
<td>2,000</td>
<td>2,400</td>
<td>2,500</td>
<td>2,600</td>
</tr>
<tr>
<td>2.4 tonnes</td>
<td>4,000</td>
<td>4,200</td>
<td>4,500</td>
<td>4,800</td>
</tr>
<tr>
<td>3 tonnes</td>
<td>6,000</td>
<td>6,200</td>
<td>6,500</td>
<td>7,000</td>
</tr>
<tr>
<td>4.5 tonnes</td>
<td>8,000</td>
<td>8,400</td>
<td>8,750</td>
<td>9,500</td>
</tr>
</tbody>
</table>

14. Our yield assumptions are conservative and consistent with the objectives of the Vision for Change (V4C) partnership of Mars, Inc. ICRAF, CNRA and ANADER in Côte d’Ivoire. V4C aims to reach 150,000 farmers in Côte d’Ivoire by 2020, triple their farms’ yields to up to 1.5 tonnes per hectare and, as such, increase their household income up to $5,000.
16. FSG. Shared Value in Côte d’Ivoire [Internet]. Available from: http://www.fsg.org/
Conclusion

Through Phase I of this long-term project to increase access to finance for cocoa farmers in Côte d’Ivoire and beyond in West Africa, the Rainforest Alliance has developed a tool that can be used to identify R&R projects that have the ability to be financed and repaid.

The tool shows that individual farmer-level investment loans are possible. In fact, well-planned farm transformation projects can be financed with investment loans to smallholders, enabling investors with a wide range of risk and return expectations to participate.

It allows assessment of what an average farm transformation loan could look like across Côte d’Ivoire and evaluation of the total investment needs for a scaled investment loan vehicle. For example, if a 3-ha farm needs an average of a $2,500 for a R&R plan, investment in 100,000 farmers might lead to a $250 million investment vehicle.

Enabling Discussion

Until now, consideration of on-farm R&R financing has been held back by the lack of common base for discussion and the absence of decision-making tools. By providing a tool to assess investment loan amounts and repayment opportunities, the Rainforest Alliance aims to facilitate discussion between investors, lenders, development professionals and cocoa industry stakeholders.

Next Steps

Based on Phase 1 results, the Rainforest Alliance aims to work on Phase 2 to:

- Evaluate potential loan delivery and funds flow mechanism(s);
- Design an investment pilot program;
- Select participants and partners and;
- Support development and fundraising for a pilot and scaled investment loan vehicle.

A critical piece of Phase 2 will be to design a farmer loan delivery mechanism appropriate to the local environment. At present, because of structural barriers inherent to Côte d’Ivoire, cocoa farmers have very limited access to finance. Designing the right delivery mechanism and intermediary will require working with all actors along the cocoa value chain as well as service, input and technical assistance providers. To evaluate multiple possibilities, the Rainforest Alliance aims to evaluate several models for the implementation of a targeted $2.5 million pilot project including about 1,000 farmers (depending on funding).

Following Phase 2 success and learning, Phase 3 and beyond will entail scaling the investment model to engage large investors and potentially reaching hundreds of thousands of cocoa farmers, thereby transforming the prospects for cocoa farmers and the cocoa industry in Côte d’Ivoire.
For More Information, Please Contact:

Michelle Buckles, Rainforest Alliance Director of Sustainable Finance Initiative
mbuckles@ra.org

Hélène Roy, Sustainable Finance Consultant
roy.helen@gmail.com

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- Lucian Peppelenbos, Program Director of Learning & Innovation, IDH;
- Nate Schaffran, VP Global Programs, Africa, Root Capital;
- Andrea Wilhelmi Somé, Program Manager, GIZ.

About the Rainforest Alliance

Since its founding in 1987, the Rainforest Alliance has operated on the principle that natural resources can only be conserved if the economic needs of the communities that depend on them are also met. The Rainforest Alliance applies market-based solutions that promote sustainable methods in agriculture, forestry and tourism, as well as support the economic and social wellbeing of workers, families and communities. The Rainforest Alliance involves businesses across the supply chain and consumers worldwide in bringing responsibly-produced goods and services to a global marketplace where the demand for sustainability is growing strongly.

The Rainforest Alliance focuses on three sectors—forestry, agriculture and tourism—with the greatest potential impact on land-use practices. The Rainforest Alliance has certified more than 190 million forested acres (77 million hectares) worldwide to the rigorous standards of the Forest Stewardship Council. The Rainforest also works with farmers and agricultural cooperatives around the world to promote agricultural practices that conserve water and soil resources, reduce pesticide use and provide fair treatment of workers. As of 2012, more than 875,000 farms and producer groups earned the Rainforest Alliance Certified seal of approval for meeting the requirements of the Sustainable Agriculture Network Standard. The Rainforest Alliance is also a leading validator of forest based carbon-offset projects, ensuring that they meet rigorous, internationally recognized carbon standards. The Rainforest Alliance has also developed best management practices for hotels and tour operators, and it provides technical assistance to help entrepreneurs implement these practices, obtain verification and/or certification, and market their services to conscientious consumers.

About the Sustainable Finance Initiative

The Rainforest Alliance recognizes that in order to conserve our world’s most precious ecosystems, we must promote an economically viable future for those who depend on the land for their livelihoods. Our Sustainable Finance Initiative (SFI) program was established in order to support small and medium-scale farms and forestry enterprises working toward Rainforest Alliance certification, and those already certified, to access the financing they need to help their business grow and become economically sustainable.

The Rainforest Alliance provides support to certified producers and SMEs, and those in the process of achieving certification, by helping identify their financial needs, supporting the credit application process, connecting them with business and financial management technical assistance, and linking them with the appropriate financial institutions. The Rainforest Alliance does not lend money or assess credit worthiness directly but makes introductions to lenders who then complete their own due diligence. The Rainforest Alliance also works to educate these institutions about the investment needs of sustainable producers, the risk-mitigation benefits of sustainability and certification, and to influence the design of financial products suitable for sustainable producers.