# SDM: ECOM/SMS Ghana

Service Delivery Model Assessment

June 2016

the sustainable trade initiative

NewForesight

# Foreword from IDH, The Sustainable Trade Initiative

## Importance of Service Delivery

IDH and partners are investing significant funding and resources in the development of "service delivery models": supply chain structures which provide services such as training, access to inputs and information to farmers required to increase their performance. But not so much is known about the performance and impact on the beneficiaries of Service Delivery Models (SDMs) – there are no hard data on effectiveness, and a lack of insight into best practices. As a result, many organizations may be reinventing the wheel when developing and investing in SDMs.

IDH is bringing together key partners to gain better insight into the cost-effectiveness, scalability and financial self-sustainability of SDMs. By analyzing different SDMs, IDH would like to learn together with partners on what works, where and why, and on how to improve the performance of SDMs by optimizing the model and, in some cases, even modifying the model.

## About this study

In the approach of this study, there is a strong focus on the "economic sustainability" of SDMs and the "Return on Investment" for farmers, service providers and value chain investors. The tool that is developed in this study offers the possibility to assess efficiency and effectiveness of a SDM at different stages of a SDM lifetime.

IDH acknowledges though that SDMs can and should also contribute to the social and environmental dimensions of sustainability of farms as well as farmer families and communities. Investment decisions would need to be taken based on a complete picture of a SDM, including the social and environmental Return on Investment.

With this study, IDH would like to create more intelligence on SDMs and, therewith, more effective service delivery to smallholder farmers which will support overall sector development. We hope that sharing this case report is a good starting point.

## Thanks

IDH would like to express its sincere thanks to ECOM for their openness and willingness to cooperate with IDH in this study and to provide insight into their model. Also the feedback on the way of analyzing SDMs has been very useful for this study and for the thinking of the way forward

# Introduction by ECOM/SMS Ghana

## About ECOM SMS

ECOM is one of the leading supply chain managers in Ghana's cocoa industry. ECOM sustainable management services – SMS- has extensive reach which covers 2,500 cocoa communities and more than 120,000 smallholder cocoa farmers. SMS works with over four thousand local staff including agronomists, field technicians and farmer trainers.

By leveraging ECOM's buying structure, SMS has an extensive reach to remote communities, offering farmers a package of agronomic, financial and community development services. SMS delivers farm and community interventions through Farmer Development Centers established across the cocoa producing areas.

Through 90 Farmer Development Centers SMS delivers additional services which improve quality, productivity and access to premium markets leading to better livelihood. SMS contributes to the development of cocoa communities by providing required infrastructure in the areas of education, health, water and sanitation.

## About this study

This SDM study allows ECOM to have a deeper look into the components of its service delivery model and to better understand what drives farm productivity and profitability. As such it provides insights as to what the changes are that ECOM might consider in order to make its delivery model sustainable in the long run and at scale.

The financial modeling tool and sensitivity analysis of the various SDM components will become a very useful resource for our management decisions when we are able to utilize real data from our data collection on the outcomes and impact of our model. Such a tool will allow us to refine our understanding by moving away from 'assumptions' about yield and costs to real data, which we are currently gathering in the field. It is a great tool not just to model our service delivery model into the future but also evaluate its sustainability when at scale.

The study clearly emphasized the need and the importance to have real data not just for the purposes of SDM modeling, but for making sure that services and products delivered through the SMS model deliver most impactful results for farmers.

# Reading guide

Introduction to the SDM

page 5

The first chapter introduces the SDM and its terminology, explains why the study is undertaken and how it is done

Presentation of the Theory of Change and the SDM

page 11

The second chapter gives an overview of the sector, the Theory of Change, the SDM and and the entities involved

Detailed overview of the services in the SDM

page 17

The third chapter gives a detailed overview of the services, and the flows of goods and money between the actors in the SDM

Economic sustainability of the SDM

page 24

The fourth chapter assesses the economic sustainability of the model through detailed analysis of the impact of the SDM at the farmer, service provider and Value Chain Investor (VCI) level

Conclusions and lessons learned

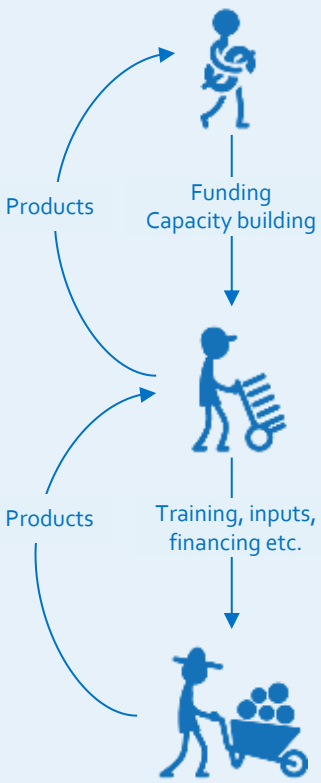
page 30

The last chapter presents the conclusions and lessons learned

# Introduction to the SDM

# What is a Service Delivery Model (SDM)

## Simplified Overview of an SDM[1)]




**Value Chain Investor**
Invests (financial) resources into the SDM and guides the (initial) rolling out of the model

**Service Provider**
Delivers one or multiple services directly to the farmer

**Farmer**
Receives services and sells products to the Service Provider and / or Value Chain Investor

SDMs are supply chain structures which provide services such as training, access to inputs and information to farmers required to increase their performance and sustainability.

The goal of an SDM is achieving and furthering one or more of the following objectives:

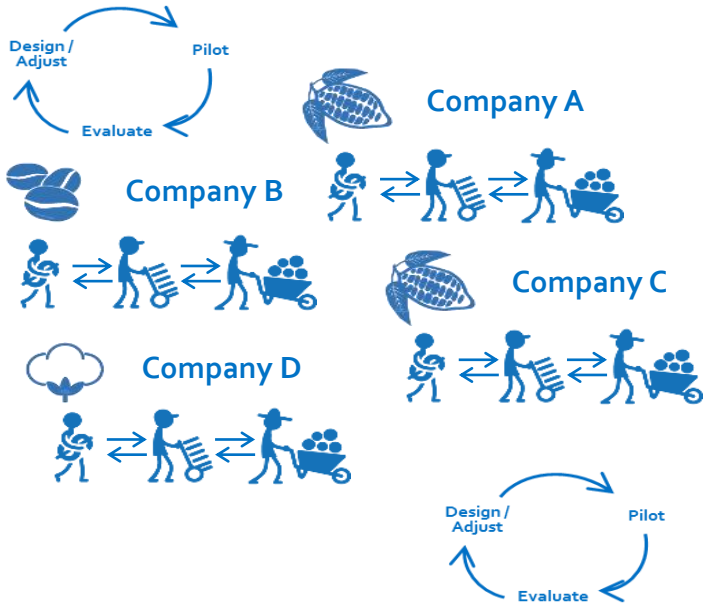
*Focus of this study*

1. **Economic sustainability**
   - Farm: providing access to interventions that boost productivity, quality and net income
   - Service provider: cost-effective operations and effective provision of services
   - VCI: a cost-effective SDM where (commercial) benefits are worth the investments and costs
2. **Social sustainability**
3. **Environmental sustainability**

1) The reality of SDMs is often more complex. Funding can come from donors or foundations that do not seek commercial return. Companies might also invest in an SDM without linking it to commercial/sourcing activities

# What are the issues

**Big diversity of SDMs**




SDMs are very diverse. They operate in different sectors and contexts, are based on different approaches and have different objectives. Each SDM has its own learning cycle and works in isolation

**Issues and implications**

As a consequence there is generally:

1. No holistic view on a company's activities (incl. costs, benefits, etc.)
2. Limited learning within a company
3. Limited learning across companies / within industry

These issues in turn lead to lost opportunities in identifying improvements on cost-efficiency and effectiveness

# What is the aim of this project

**The SDM study aims to undertake the following actions …**

1. **Map variety of SDMs** by different companies in different sectors and geographies on their objectives, structure and organization, types of services, delivery approach etc.
2. **Analyze the economic sustainability** of the SDMs at the level of the farmer, service provider and VCI
3. **Extract lessons learned** on key success factors, risks, scalability, cost-effectiveness etc.
4. **Develop a standardized Tool** to be used across different SDMs to analyze economic sustainability in a holistic and harmonized methodology

**… to benefit the different actors in the following ways**

**Value Chain Investor**

- Design more efficient and effective SDMs, through better insights into what works in which cases

**Service Provider**

- Gain insights into how to design and implement more efficient and effective SDMs

**Farmer**

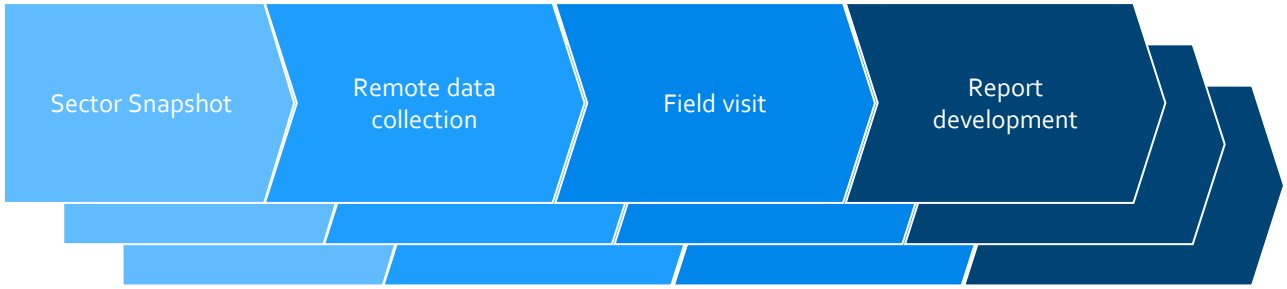
- More efficient services delivery and impact generation (better livelihoods, higher productivity, etc.)
- More transparency on whom to work with

**Other Sector Stakeholders (incl. investors)**

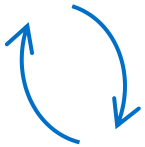
- Benefit from strategic learning trajectory within and across sectors, based on a unifying methodology
- Opportunity to join learning platform

# Overview of the SDM study approach

## Case Studies




- In each case study the SDM services, actors and flows were mapped, data collected and analyzed, and findings presented in a case report
- Three case studies in phase 1 and eight in phase 2



## SDM tool

- We designed a tool that combines user-friendliness, depth within cases, and comparability across cases to make the analyses for each case study

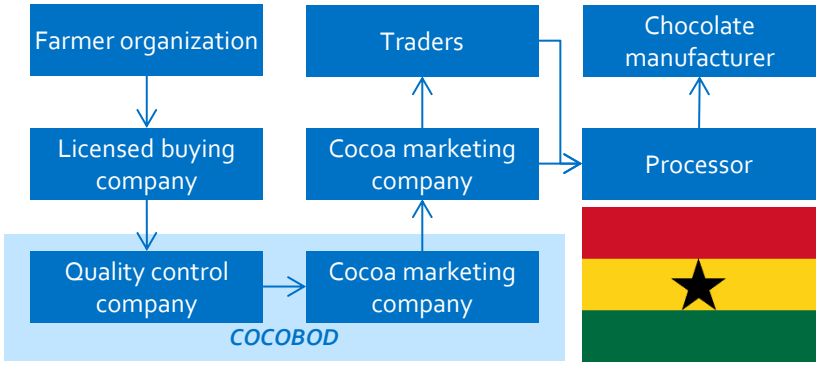
# Overview of cases done till date

| | Phase 1 | Phase 2 | | |
|---|---|---|---|---|
| Coffee | Hanns R. Neumann Stiftung – Uganda | ECOM – Vietnam | ECOM – Tanzania | TEMBO COFFEE COMPANY – Tanzania |
| | | OLAM – Cameroon | TECHNOSERVE – Ethiopia | |
| Cocoa | CÉMOI CHOCOLATIER FRANÇAIS – Côte d'Ivoire | Cargill – Côte d'Ivoire | BARRY CALLEBAUT – Côte d'Ivoire | |
| | MARS – Indonesia | ECOM – Ghana | | |

# ECOM/SMS
# Theory of Change and SDM

# Introducing country and company info

## Country and sector info




- In Ghana, 800,000MT of cocoa is grown by as many farmers on 1.6 million hectares
- The main production areas are the Western and Ashanti regions of the country South and Southwest
- COCOBOD, the government-led marketing board for cocoa, governs and manages the sector
- COCOBOD is responsible for marketing as well as quality control
- All Ghanaian cocoa must be sold through licensed buying companies (LBC) to Cocoa Marketing Company (CMC)
- COCOBOD sets the farm gate price for cocoa

## Company info

- ECOM is one of the world's largest cocoa traders, operating world-wide through 17 Cocoa Offices
- AGL (Agro-ECOM Ghana Limited) acts as LBC in Ghana, buying from farmers
- ECOM as trader sells to CMC.
- AGL runs district buying stations in main cocoa-growing areas where cocoa is bought from collectors (purchasing clerks), stored and distributed
- SMS is the ECOM-owned company that implements sustainability solutions for ECOM's clients
- Jointly SMS and ECOM provide sustainable farmers solutions

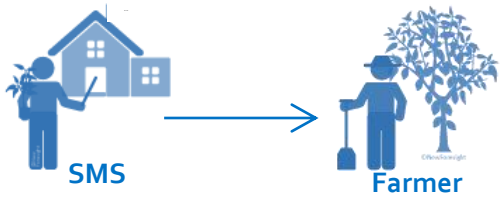
# Theory of Change

## Objectives


The main objective for ECOM SMS is to achieve and maintain a stable, sustainable supply base from which to source fully traceably cocoa. To that end, this SDM aims to…

1. Improve the productivity of farmers
2. Increase the resilience of cocoa-growing communities
3. Motivate farmers to sell their cocoa through ECOM

## Services



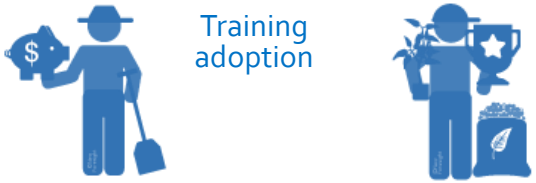

**What**: As part of this SDM, the following services are offered: farmer organization, training, fertilizer and crop protection, equipment, planting material, and community infrastructure

**How:** The services of this SDM are provided as a comprehensive package by SMS

**Whom:** This SDM is aimed at farmers as well as their communities

**Costs:** The costs of this SDM are borne by the VCI, with farmers paying for certain services themselves

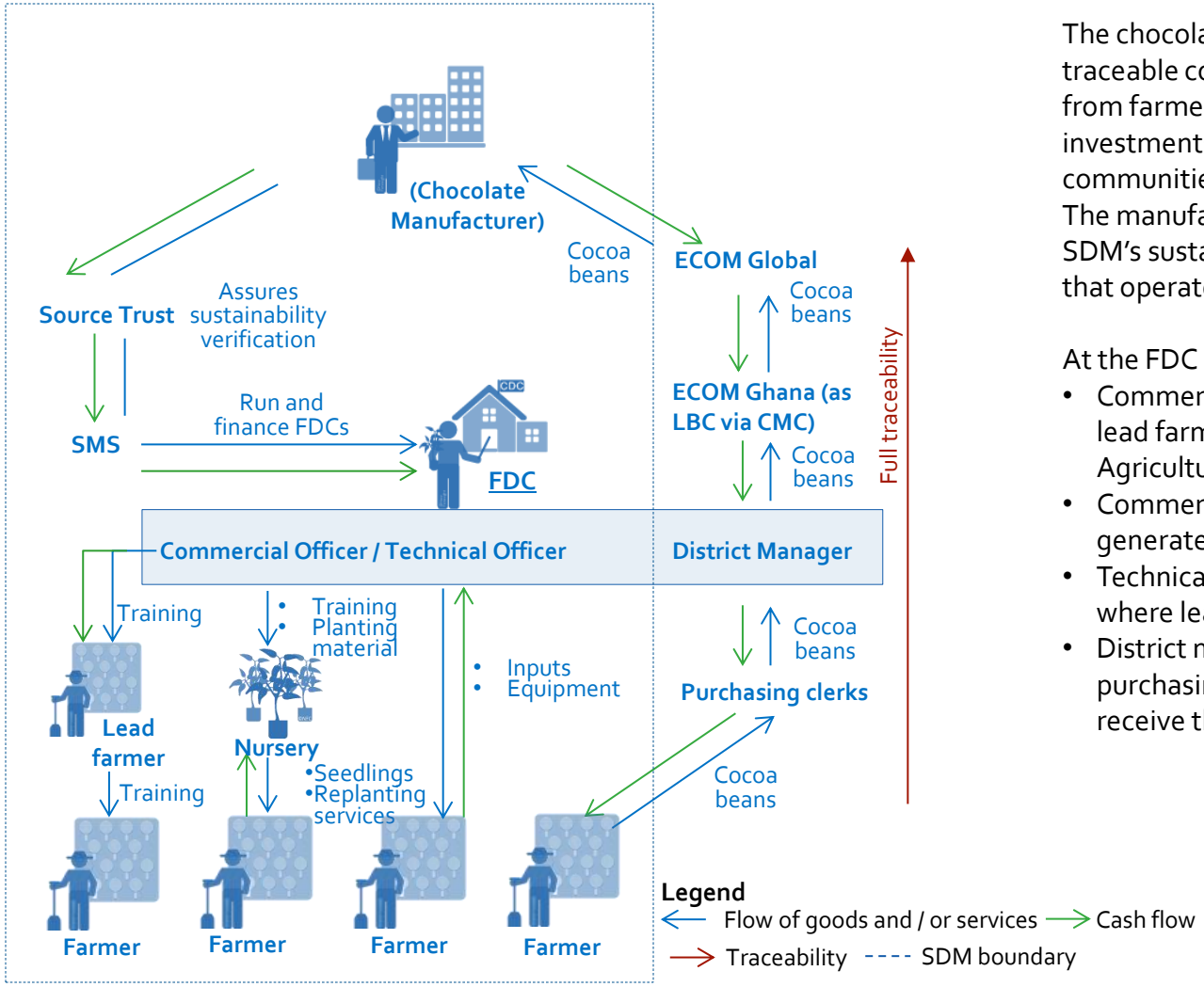
## Key drivers




The key drivers for the success of the SDM are:

1. Farmer training adoption
2. Farmers' favorable opinion on service provision leads them to sell to ECOM

# Overview of services and revenue flow in the ECOM/SMS SDM




The chocolate manufacturer sources fully traceable cocoa through ECOM's Ghanaian LBC from farmers that have received certain investments into their productivity and communities.
The manufacturer pays Source Trust to direct this SDM's sustainability services through SMS, a firm that operates FDCs.

At the FDC level…

- Commercial officers employed by SMS train lead farmers that in turn train farmers on Good Agricultural Practices (GAP);
- Commercial officers direct nurseries that generate new planting material;
- Technical officers run demonstration farms where lead farmers can train farmers;
- District managers source cocoa from purchasing clerks that buy from farmers that receive the aforementioned services.

# Profiles of value chain investor and service providers

| Entities | Category | Activity in the sector | Activity in the SDM |
|---|---|---|---|
| ECOM | Service Provider | • ECOM Agroindustrial Corporation is a global commodity trading and processing company with its own cocoa division and a significant market share in cocoa trading | • ECOM sources cocoa from purchasing clerks through commercial officers, selling it via COCOBOD as a Local Buying Company<br>• ECOM co-directs Source Trust in its sustainability and traceability services to achieve the impact it requires |
| sourcetrust sustainability in action | Service Provider | • Source Trust is an ECOM-affiliated NGO that plans and carries out traceability services and delivers sustainability projects | • Source Trust ensures the traceability of cocoa beans<br>• Source Trust plans sustainability projects for ECOM, which are then carried out by SMS |
| SMS Sustainable Management Services | Service Provider | • SMS work with farmers in several tropical agro-commodity sectors to improve farming practices | • SMS consultants train FDC (farmer development center) personnel, nurseries and lead farmers |

Source: entities' websites; NewForesight field research

# Profiles of entities in the SDM

| Entities | Category | Description | Activities in the SDM |
|---|---|---|---|
| FDCs (Farmer Development Centers) Commercial and Technical Officers | Part of SDM | • Composed of around 1,250 farmers aiming to deliver 1,000 MT of cocoa<br>• Commercial element (sourcing) as well as service provision<br>• Service provision staff (Commercial & Technical Officers) trained by SMS | • Provision of traceability services<br>• Farmer organization for traceability<br>• Sale of agro-inputs and equipment<br>• Farmer training<br>• Establishment of nurseries<br>• Community development (boreholes, schools, VRCs) |
| Lead farmers | Part of SDM | • Expert farmers trained by FDC staff | • Provide trainings to other farmers (free of charge)<br>• Register farmer readiness to receive inputs |
| Nurseries | Part of SDM | • Either one centralized or multiple community nurseries are established per FDC. These are run by farmers with expertise in propagation of planting material | • Sell cocoa tree seedlings to farmers carrying out rehabilitation on their plots (or establishing new plots) |
| District manager | Part of supply chain | • Responsible for sourcing cocoa from purchasing clerks<br>• Works with Commercial Officer at FDC<br>• Helps ensure farmers that supply the purchasing clerks receive services | As these entities are not part of the service delivery model, they fall outside the scope of analysis. However, as they are part of the value chain, they are briefly described here to provide a complete picture. |
| Purchasing clerk | Part of supply chain | • Present in every cocoa-producing village<br>• Compete for suppliers through e.g. handing out informal credit<br>• Sometimes offer cash premiums or in-kind contributions like soap to secure suppliers | |

Source: NewForesight field research

# Overview of the SDM services

# Overview of services in the SDM

## Farmer training and organization

- Farmers are organized in groups of 30-40 farmers per community. One FDC services around 1,250 farmers.
- This is necessary to allow traceable verified cocoa to be sold
- Curriculum of Good Agronomic Practices (GAP), Good Environmental Practices (GEP), Good Business Practices (GBP) taught at FDCs and by lead farmers to cohorts of organized farmers
- Demo plots are established for practical learning

## Planting material

- Seedlings are developed in nurseries run by selected farmers
- Cocoa seedlings for replanting are sold to farmers
- Farmers are trained in replanting and seedling nursery management techniques

## Fertilizer and crop protection

- Input packages contain a selection of fertilizer, pesticides and fungicides
- Crop protection are to be sprayed manually (sprayer part of package) or by motorized sprayer (for hire)
- Farmers are trained on correct fertilizer application on demo plots

## Community support

- 137 boreholes in 34 districts provide potable water for cocoa growing communities
- 29 Village Resource Centers improve youth's and adults' education

# Sequence of SDM services for a single cohort of farmers

**Yr 1** **Yr 2** **Yr 3** **Yr 4 …**

## Farmer organization

- Farmers are organized in groups of 1250 to allow function of traceability services

## Fertilizer and crop protection year 1

## Fertilizer and crop protection subsequent years

- In year one, farmers as a group invest in spraying equipment and crop protection chemicals
- In subsequent years, farmers can choose from three fertilizer and crop protection packages at various price points

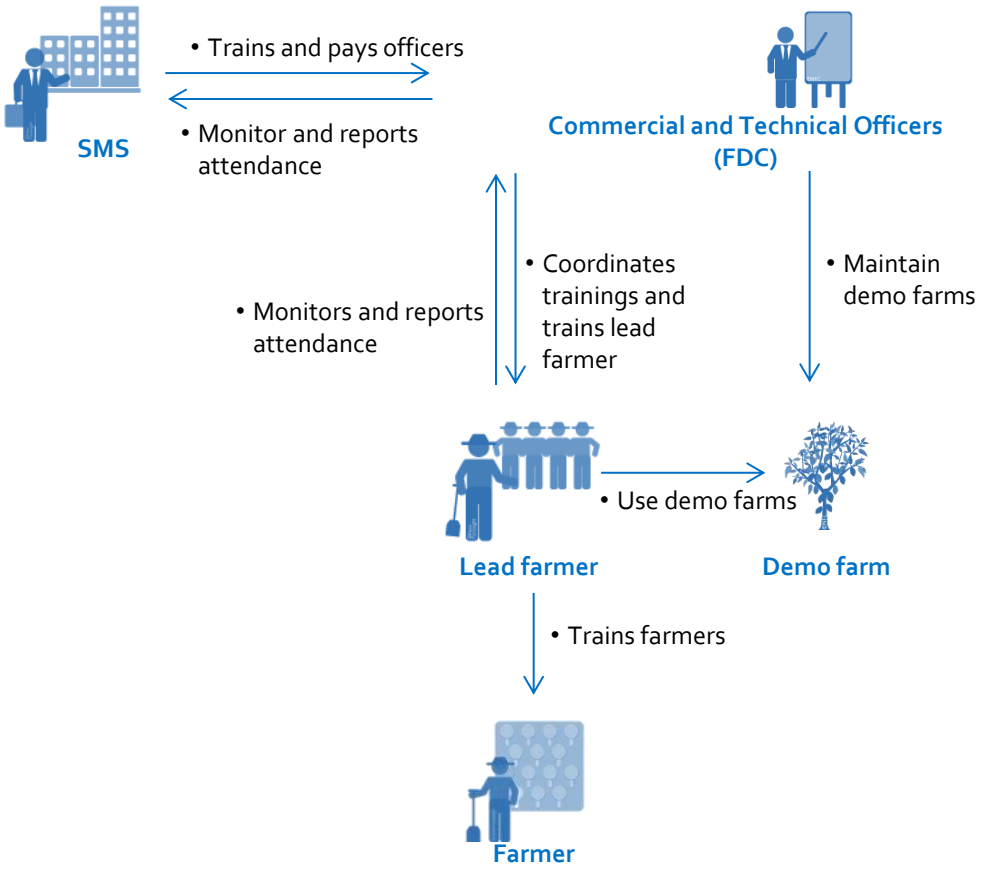
## Training

- Farmers receive training according to a curriculum of GAP, GEP and GBP

## Planting material

- Cocoa seedlings are sold to farmers at a low price (covering costs of running community nursery) to encourage cocoa plot rejuvenation

# Overview of Training




**Description**

- Farmers are trained by lead farmers in GAP, GEP and GBP
- These lead farmers are trained by SMS commercial officers, who in turn are trained by SMS.
- Technical officers coordinate with commercial officers when trainings are done and are responsible for the monitoring of correct fertilizer application on the demo plots

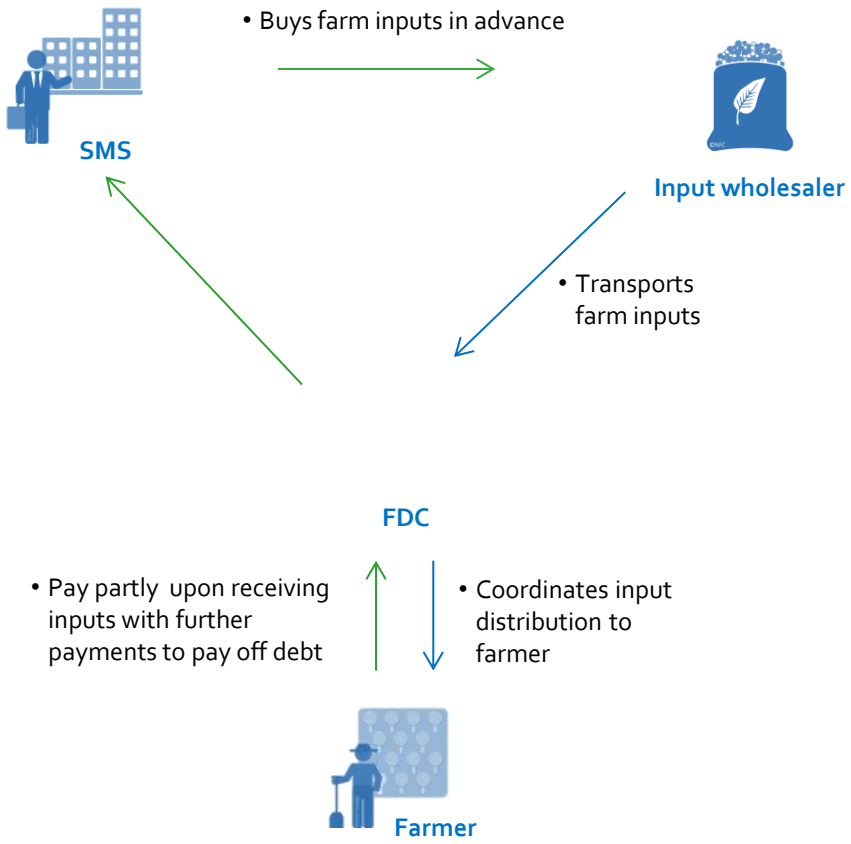
**Financial Flows**

- Training is fully funded through SMS (paid by the VCI), with matched funding by IDH

**Impacts**

- Improves adoption rate of knowledge of farmers, in turn improving productivity
- Improves farmers' understanding of costs of production
- Could in theory also allow for certification to be set up (which could lead to paying of premium)

# Overview of fertilizer and crop protection




**Description**

- Different input packages are offered to farmers by SMS, consisting of crop protection with or without fertilizer and/or motorized spraying

**Financial Flows**

- Farmers pay a 40% down payment and the remainder later and are rewarded with in-kind incentives if they pay on time
- SMS makes a margin of about 10% on input pre-financing

**Impacts**

- Increased productivity
- Potential impact: financial revenue for independent (self-financing) FDC - a model that SMS is exploring

**Legend**

← Flow of goods and services → Cash flow

# Overview of Infrastructure and Community Support

Manages several community development projects:
- Village Resource Centers
- Boreholes


- Construction is outsourced to contractors with help from the community


**Description**

- The VCI provides for the drilling of (73) boreholes by SMS staff as well as the construction and maintenance of 20 Village Resource Centers near schools, where school-going children can use computers to further their education

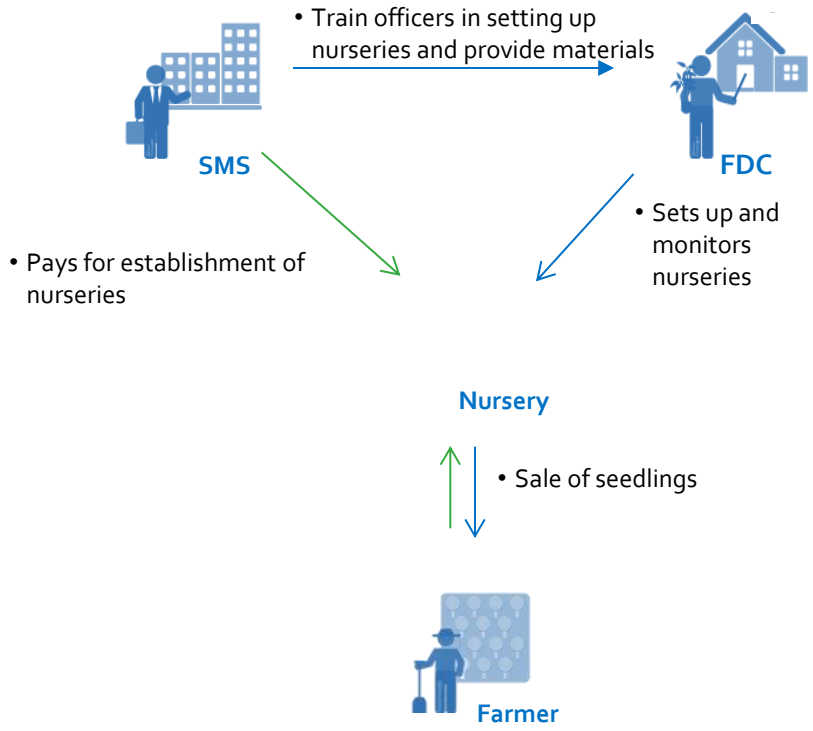
**Financial Flows**

- Financing for these services is paid for through the VCI fee

**Impacts**

- Improved livelihood, in the near term because of better access to water for the community and in the longer term because of education for the younger generations.

# Detailed overview of Replanting




**Description**

- There are 4 community nurseries to each FDC with a capacity of up to 7,000 seedlings each
- This brings the seedlings closer to farmers, reducing the number of seedlings damaged in transport, and allows farmers to be involved in growing the seedlings in the nurseries

**Financial Flows**

- Farmers pay the nursery a marginal fee for seedlings, that covers the cost of maintaining the nursery

**Impacts**

- Cocoa farm rehabilitation
- Improved productivity of new plant material relative to old stock

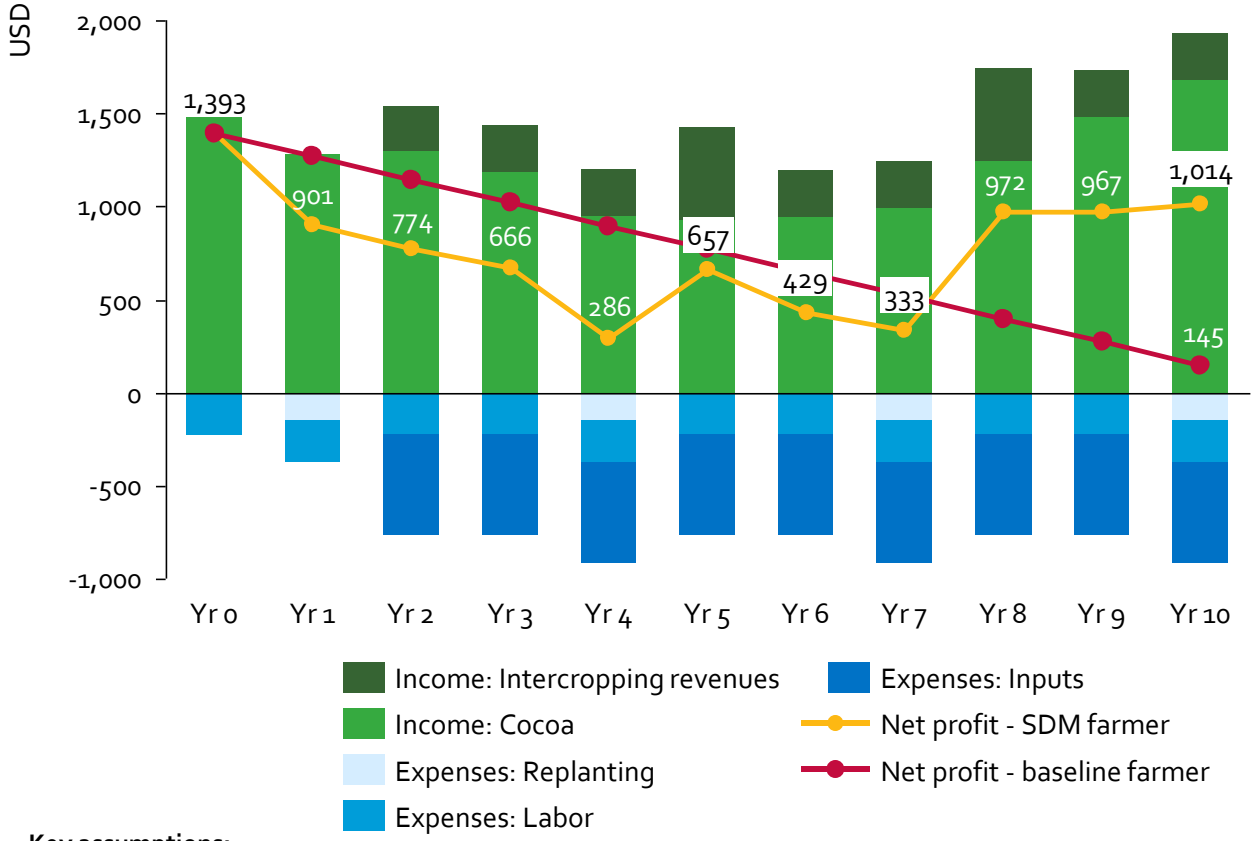
**Legend**

←Flow of goods and services →Cash flow

# Economic, social and environmental outcomes

# Farmer P&L

**Individual farmer (1.9 ha cocoa farm) entering the program in year 1**




**Economic sustainability at farm level**

**Main revenue drivers**

- Trees typically reach peak productivity after 9 years and remain productive until 25-30 years old – at a base age of 25 years (average) the old stock dips quickly in productivity
- Due to the replanted 25% of the farm being completely unproductive until after the third year of replanting, profit immediately dips in year 1 and only surpasses the baseline scenario in year 9
- Intercropping with plantains substantially elevates revenues during intercropping years

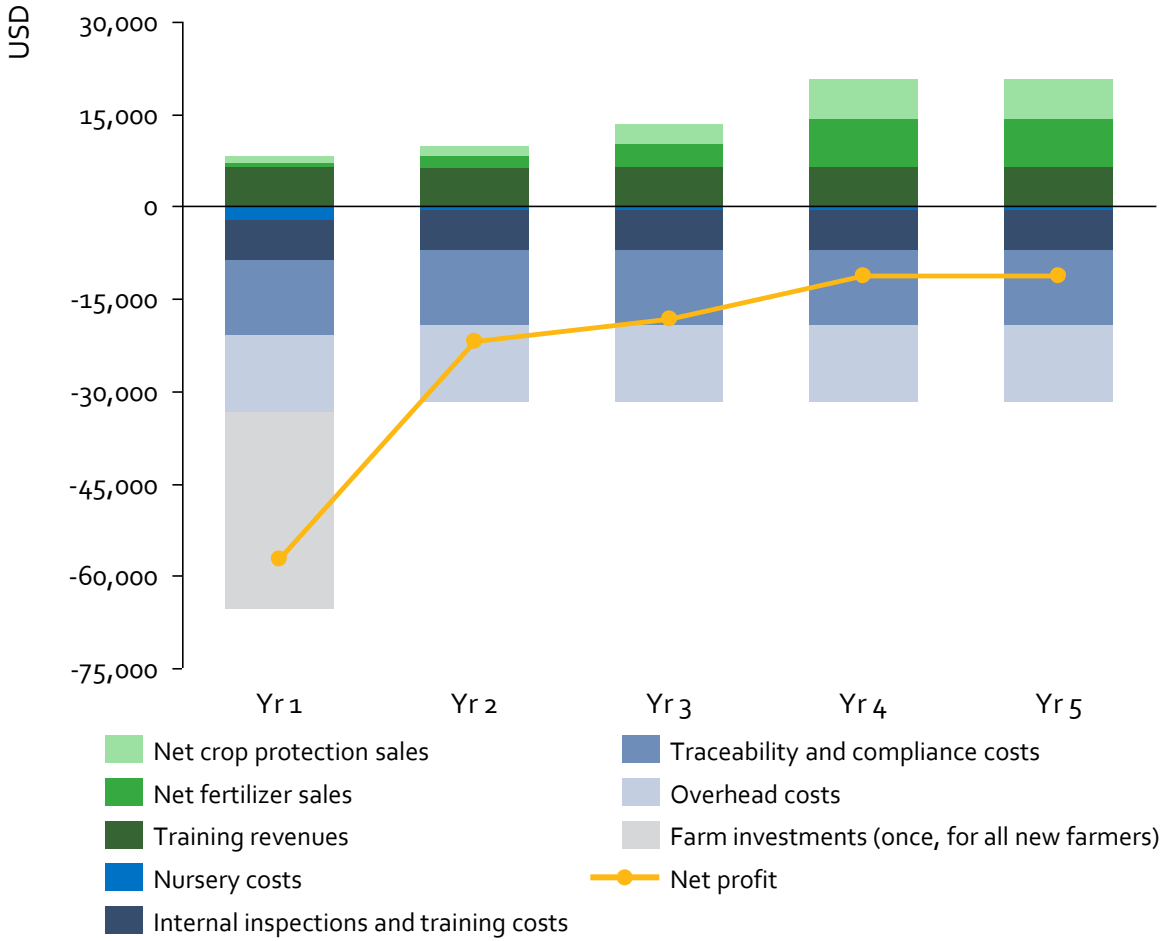
**Main cost drivers**

- Agro-inputs are the highest costs ($286 /ha for fertilizer and crop protection) throughout all seasons
- Replanting costs are incurred in several years covering costs of cocoa seedlings and intercropping plant seeds
- Labor costs remain relatively stable as additional labor needs are covered by people from the community at no costs

**Key assumptions:**

- Farmers replant 25% of their plot every third year (starting in year 1)
- There are no harvesting costs as the community helps each other during harvest
- Cocoa prices are set at current 2014/2015 COCOBOD price (1,725 USD/MT)
- Newly planted cocoa trees have a maximum productivity of 1,000 kg/ha
- Training, crop protection and fertilizer use add 5% each to baseline productivity
- Intercropping revenues are made from the 2nd until the 4th year after replanting (for the respective part of the farm). Yields are assumed constant

# FDC P&L with community nursery




**Economic sustainability at provider level**

**Main revenue drivers**

- The FDC is primarily a sustainability service that guarantees sustainable cocoa supply
- While cocoa sales from purchasing clerks are arranged at the FDC and the FDC can thus be seen as a buying station for its farmers, this commercial aspect of FDCs is outside our scope of analysis and thus no cocoa sales revenues are captured here
- Income from fertilizer and crop protection sales (10% margin) increases steadily as the number of farmers supplied increases.
- Out of the 1,250 farmers per FDC, 5% are assumed to be supplied with inputs in year 1, to 40% in year 4 onward.

**Main cost drivers**

- One-time establishment costs amount to about 50% of total costs in year 1.
- Annual overhead costs are relatively evenly spread between inspection costs, audit fees, traceability and mapping services and staff cost.
- Community nurseries require half the establishment costs of a centralized nursery, while community overhead costs are slightly higher. This should be offset by the higher capacity of community nurseries.

**Key assumptions:**

- A single FDC services 1,250 farmers. The % of farmers supplied with inputs grows as follows: 5% (Y1), 10% (Y2), 20% (Y3) to 40% (Y4 onward

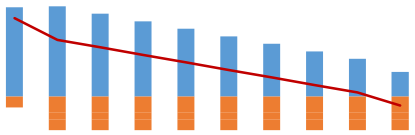
# Sensitivity analysis (1/2)

## A. Replanting Rates

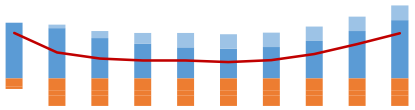
Likelihood: High | Impact: High

- **Description:** with an average age of around 25 years, cocoa trees in Ghana experience declining yields
- **Risk:** low yields eventually lead to lower farmer incomes and lack of and/or more expensive cocoa for ECOM Ghana
- **Mitigation:** gradual replanting of old trees ensures productivity increases in the long-term. Intercrops can be grown on those parts of the farm where trees are cut down, offsetting part of the lost income due to lost yields

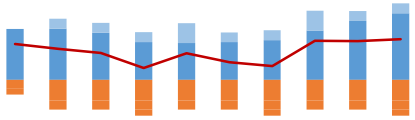
*Scenario 1: no replanting*



*Scenario 2: 10% annually*



*Scenario 3: 25% every 3 years*



### Discussion

10% gradual replanting (scenario 2) shows a slightly less severe income drop ($387 in Yr6 vs. $286 in Yr4), higher year 10 net income ($1,184 vs. $1,021) yet lower 10-year average net income ($670 vs. $700).

Note that the lower year 10 net income in scenario 3 (vs. scenario 2) can be explained by the 25% replanting taking place that year

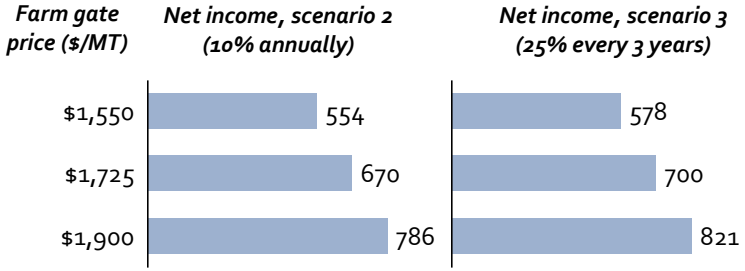
*Note: intercrops are assumed to be grown on the replanted part of the farm until the fourth year after cutting down the trees*

## B. Cocoa Prices

Likelihood: Medium | Impact: Medium

- **Description:** cocoa prices are an important driver of farmer income, yet are outside of the SDM control
- **Risk:** low cocoa prices can significantly reduce farmer incomes as expenses remain relatively stable
- **Mitigation:** farmers could cut agro-input expenses when prices drop. Intercropping makes them less dependent on cocoa income, mitigating part of the price shock

*10-year average net income, for different farm-gate prices*




### Discussion

A 10% change in cocoa prices leads to a 17% change in the 10-year average net income in both replanting scenarios. Still, a price drop is more critical in scenario 3 as it leads to a lowest annual income of $197 in year 4 compared to $312 in year 6 for scenario 2. Thus, while gradual replanting leads to a slightly lower average net income it mitigates the impact of negative prices shocks

*Note: assumptions of scenarios 2 and 3 apply (left-hand side of this page), prices are assumed constant over time*



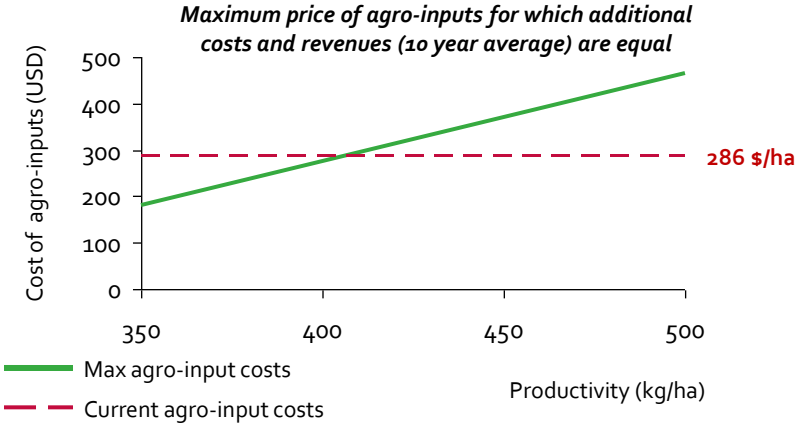
Net income

# Sensitivity analysis (2/2)

## C. Agro-input costs

Likelihood: Medium | Impact: Medium

- **Description:** agro-inputs can significantly improve a farmers yield, yet are a significant investment for the farmer
- **Risk:** additional revenues from improved yields due to application of agro-inputs might not always weigh up to the additional costs
- **Mitigation:** understanding of the actual yield impacts of services can help determine the maximum price of inputs for which the farmers still benefit




### *Discussion*

At current costs of agro-inputs (286 $/ha) it is worth for a farmer to invest as long as the 10-year average yields are expected to be above 400 kg/ha. For an ECOM farmer to obtain such yields the total impact of services* on baseline yields should be at least 28%. With the current expected total impact of 15%**, leading to yields of 369 kg/ha, this is not the case.

** Joint impact of training, fertilizer and crop protection application. Note that this is excluding replanting.*

*** 15% expected income based on ECOM/SMS estimations*

# Key indicators

## Training

| Indicator | Figure |
|---|---|
| Farmers trained per FDC / year | 1,250 |
| Cost per farmer per year (% paid by SMS) | $5 (70%) |
| # of training modules per farmer | 4 |
| Productivity impact | +5% |
| Farmer payment for training | $0 |

## Agro-inputs

| Indicator | Figure |
|---|---|
| Farmers supplied with agro-inputs per FDC | ~250 *(2015)* |
| Productivity impact | +10% |
| Farmer payment for fertilizer | $156 / ha |
| Farmer payment for crop protection | $130 / ha |
| % of costs paid by SMS | 0% |

## Planting Material

| Indicator | Figure |
|---|---|
| Nursery establishment paid by VCI | Yes |
| Nursery operations paid by VCI | No |
| Nursery operational cost per seedling | $0.03 |
| Price per seedling (from nursery) | $0 |

# Conclusions and lessons learned

# Conclusions: key drivers for success and key risks

## Key drivers of success

- SMS offers a training program that appears relatively sophisticated and covers a broad curriculum, offered in cohorts – with repeater trainings to strive for high adoption rates.
- Tree age, and related productivity levels, on Ghanaian cocoa farms are at a level that do require an aggressive replanting effort. If farmers are aware of the long term consequences of tree age for their productivity they will adopt such a strategy.
- The combined services with the additional community building component are expected to have a significant impact on farmer loyalty rates, making the model attractive from a sourcing perspective.
- SMS is now implementing a sophisticated data gathering and analysis strategy, which over time should generate the results to really model service packages effective for specific farmer needs.

## Key risks

- The aggressive replanting strategy at 25% leads to a situation where the farmer does not again reach the profit he had before starting to replant. He only reaches a profit above the baseline level in year 9. This will make it unlikely that the farmer adopts such a strategy, even as his 10 year average income will be higher than without replanting or with a 10% replanting rate.
- In the current analysis the investment in crop protection and fertilizer is not worth the investment to the farmer. It should be noted that the assumed 10% joint increase of agro-inputs is particularly low.
- Farmers are thus unlikely to invest in agro-inputs. This means that the main source of income for the FDCs will not reach sustainable (self-financing) levels.
- FDCs are far removed from being profitable. It seem unlikely that they will be able to operate without reaping some of the benefits of cocoa sourcing (of which they do carry some of the costs).

# Lessons learned during the study exercise

## Opportunities for improvement

- ECOM is on the way to improving its model. With the investments it has made in implementing a data gathering and analysis strategy it is aiming to be a leader in farm service delivery in the long run.
- It does need to better understand how it could increase the impact of agro-inputs before anything. Perhaps changes can be made in the training curriculum specifically for this purpose.
- While intercropping currently already makes a substantial contribution to covering the income loss from replanting, there could be intercropping strategies that lead to even higher income levels from this source. These could be modeled and piloted.
- It seems opportune to also model different replanting strategies, besides the current 25% and 10% to explore what the optimal strategy for the farmer would be.

## Key factors in replication of the model

- The model can be made to succeed in a context where the GAP levels of farmers are such that they make effective use of farm inputs and reach productivity impacts well above the 10% that is currently modeled.
- That 10% is relatively low compared to industry benchmarks.
- With agro-inputs proven to have a more significant impact on farm productivity farmers will buy more inputs from the FDCs. These will then become closer to being financially independent.
- With greater impact from agro-inputs the replanting strategy will also become more feasible.
- Community services are a very specific factor in the SMS approach. Their impact on farm productivity is not well understood but with a positive impact on farmer loyalty this is something that could be explored in other models.

**Iris van der Velden**
*Manager Innovation Finance*
+31 (0)30 230 7854
vanderVelden@idhsustainabletrade.com

**Joost Gorter**
*Sr. Consultant*
+31 (0)30 234 8218
joost.gorter@newforesight.com