MARS Indonesia

Service Delivery Model Assessment
Case Study Report
June, 2015

the sustainable trade initiative

MARS

KPMG
cutting through complexity

NewForesight

Reading guide

Background and contextual information

page 5

The first chapter provides the methodology and background information of the case. In addition, the actors, flows and basic concepts of the SDM are introduced.

Services delivered by the VCI and the SDOs as part of the SDM

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The second chapter explains the services delivered by VCI and SDOs in detail.

Economic sustainability of the SDM

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Third chapter assesses the economic sustainability of the model through detailed analysis of the impact of the SDM at the farmer, SDO and VCI level.

Dashboards

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The fourth chapter analyses the overall performance of the SDM through ratios and indicators presented in dashboards.

Conclusions and lessons learned

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The last chapter presents the conclusions and lessons learned.

In order to facilitate browsing through the document, a pointer is included to indicate the continuity of the narrative.

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 operators 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. To further enhance this work, we welcome new participants in the 2nd phase of the SDM study where we will analyze more cases and further develop the approach.

Thanks

IDH would like to express its sincere thanks to Mars 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

The Mars CDC-CVC Model

Improving productivity is our first priority. By giving cocoa farmers the tools to secure their future, we are helping them earn a good living and pass on their skills to create the next generation of farmers.

Across West Africa and Asia, we have built a network of Cocoa Development Centers (CDCs) in partnership with international donor agencies, governments and suppliers. CDCs serve as a distribution and training hub, providing agricultural training, good quality plants, fertilizers and pesticides to farmers. In some areas, CDCs are linked with Cocoa Village Centers (CVCs): small independent businesses run by local entrepreneurs trained by a CDC. The CVCs sell approved plants and train smaller farmers.

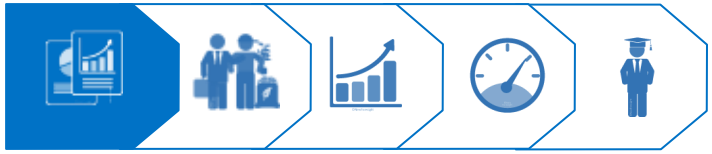
The CDC-CVC model and this report

Upon visiting Indonesia this model was just leaving the pilot stage and an M&E system was still under construction. The following report is therefore not based on historical data but projections by Mars, sometimes constructed in collaboration with the consultant. Interviews, observation and available CVC case studies were used to verify the projections insofar possible.

About MARS

While we must work in a competitive environment, the success of Mars should never be at the expense, economic or otherwise, of the people and communities with whom we work. Using our Mutuality principle, we've identified where we can shrink our environmental footprint and amplify the good we do. Our decisions are informed by science, and we aim to create sustainable, lasting benefits. This long-term perspective has helped us develop a sustainability strategy that is focused on our material impacts: land use, greenhouse gas (GHG) emissions, water use, income and human rights.

Background and contextual information



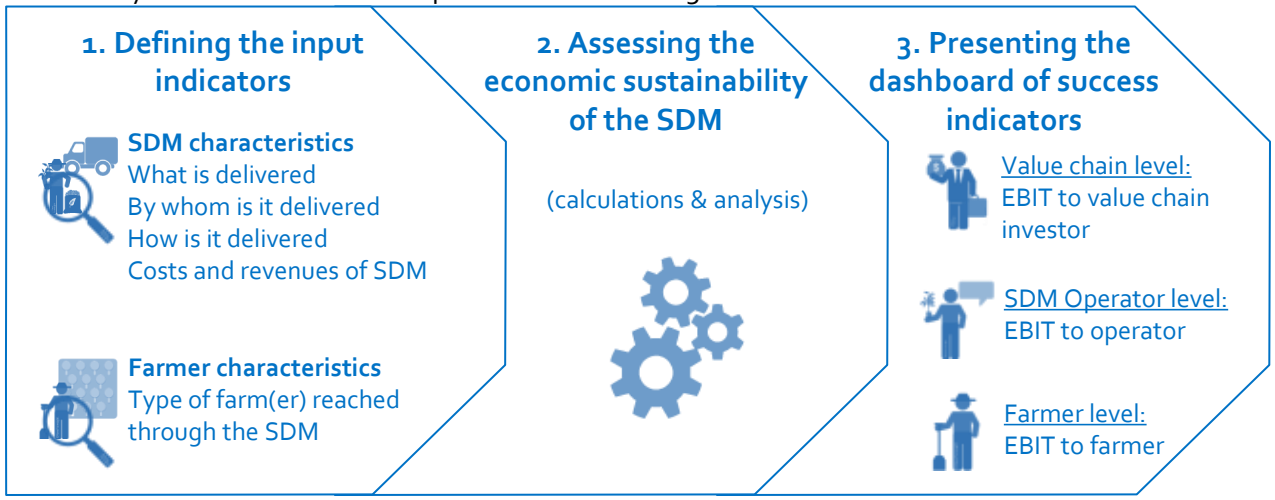
Introduction to the methodology of this study

The project focused on the economic sustainability of SDMs at the level of the value chain investor, operator and farmer. Economic sustainability is a key driver for the broader impact of the SDM as it facilitates scalability. In other words, a financially sound SDM that has a positive impact on farmer income can reach a large number of farmers and improve their livelihoods

The operator is an entity delivering one or multiple services directly to the farmer, whereas the value chain investor is defined as a value chain player that invests (financial) resources into the SDM operator and guides the (initial) rolling out of the model.

The importance and expected impact of the three levels of SDM economic sustainability will vary per stakeholder and the SDM's theory of change. By making economic sustainability explicit at all three levels, the study template will be able to generate relevant outcomes for a variety of SDMs and stakeholders involved.

The study is divided into three steps illustrated in the figure below.



This document presents the data analyzed and the findings obtained through this study.

Levels of economic sustainability

1. Economic sustainability at **investor level**:
   - *Sum of EBIT (investor income – investor costs) for all years of SDM implementation*

2. Economic sustainability at **SDM operator (SDO) level**:
   - *Sum of EBIT (operator income – operator costs) for all years of SDM implementation*

3. Economic sustainability at **farmer level**:
   - *Sum of EBIT (farm income – farm costs) for all years of SDM implementation*

Introducing the Mars Service Delivery Model and its actors

Cocoa Development Centers (CDC) and Cocoa Village Centers (CVC) is a business-oriented farm extension outreach system that aims at motivating cocoa farmers to adopt productivity interventions.

It offers cocoa expertise through continued engagement to inspire farmers to rethink their traditional approaches through a mix of demonstrations of high yielding farms and by making the Triple Productivity Package (good agricultural practices, fertilizer and improved plating material) affordable. It creates a "spoke and hub" network where one CDC supports 30 CVCs, and each CVC supports at least 100 farmers.

The CVC operator, a trained "Cocoa Doctor", invests in his business to meet the farmers' need to access planting material and inputs such as fertilizer, budwood and crop protection products, as well as rehabilitation expertise.

Companies invest in CDC-CVC networks to realize higher profits from their existing trade chains through higher volumes, better quality of beans, and building up the loyalty of participating farmers with CVCs linked to CDCs.

Mars has recently decided to link its CDC-CVC structure, originally intended to be stand-alone, to its procurement arm. They will use their CVCs as collectors. Links to certification and financing are currently being investigated.

Overview of the different entities of the CDC-CVC system

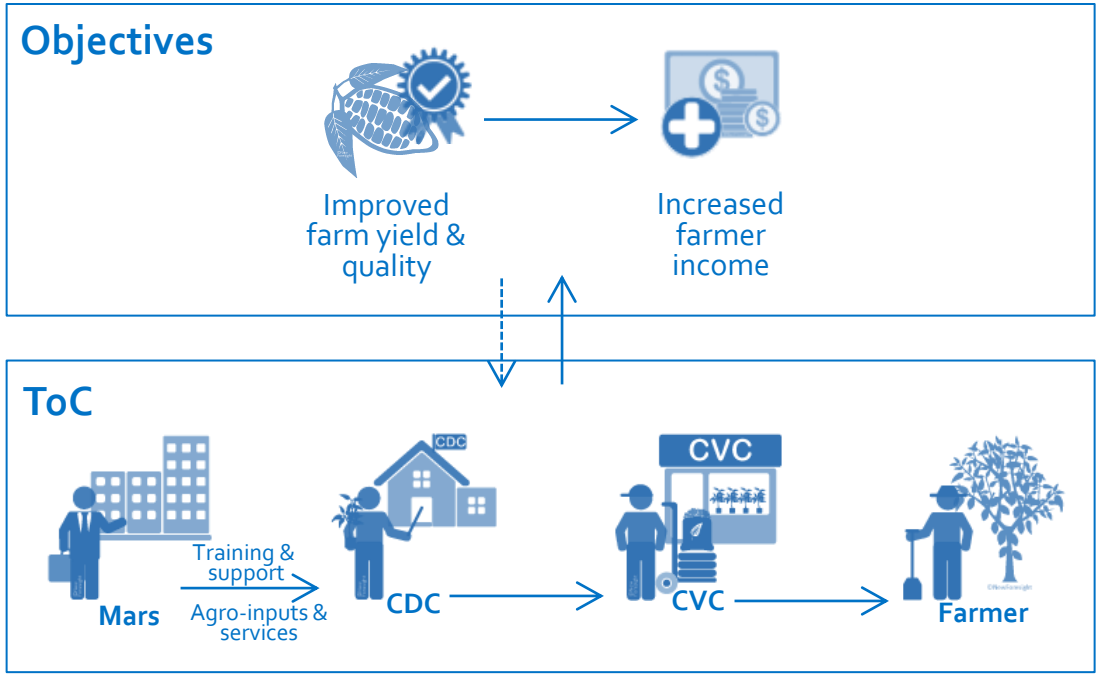
The central entity in the CDC-CVC system is Mars' **Cocoa Academy** where "Cocoa Doctors" are trained to become CDC supervisors or CVC operators and from where the entire structure is managed and monitored.

The **CDC** is a demonstration site and training/coaching site managed, permanently staffed and funded by Mars or one of its trade partners. Mars is also planning to build a certification structure around the CDC/CVC structure, constructing an ICS (Internal Control System) that will be maintained by the CDC and its CVCs.

The **CVC** is an economically independent enterprise close to the village where a "Cocoa Doctor" runs a high quality/productivity **demo plot** (the WOW farm), and a **nursery** of high quality planting material that he uses to supply his farmer seedlings and grafts. He also acts as an agent for a fertilizer company, supplying his clients with **cocoa-specific fertilizer.**

Each CVC is supposed to have a **client base** of 100 returning farmers. These farmers are supposed to be selected by the CVC operator as potential high-productivity farmers to reach maximum impact for the model and ensure successful uptake of the inputs.

Mars Theory of Change: Impacting farmer yield, quality and income through SDM



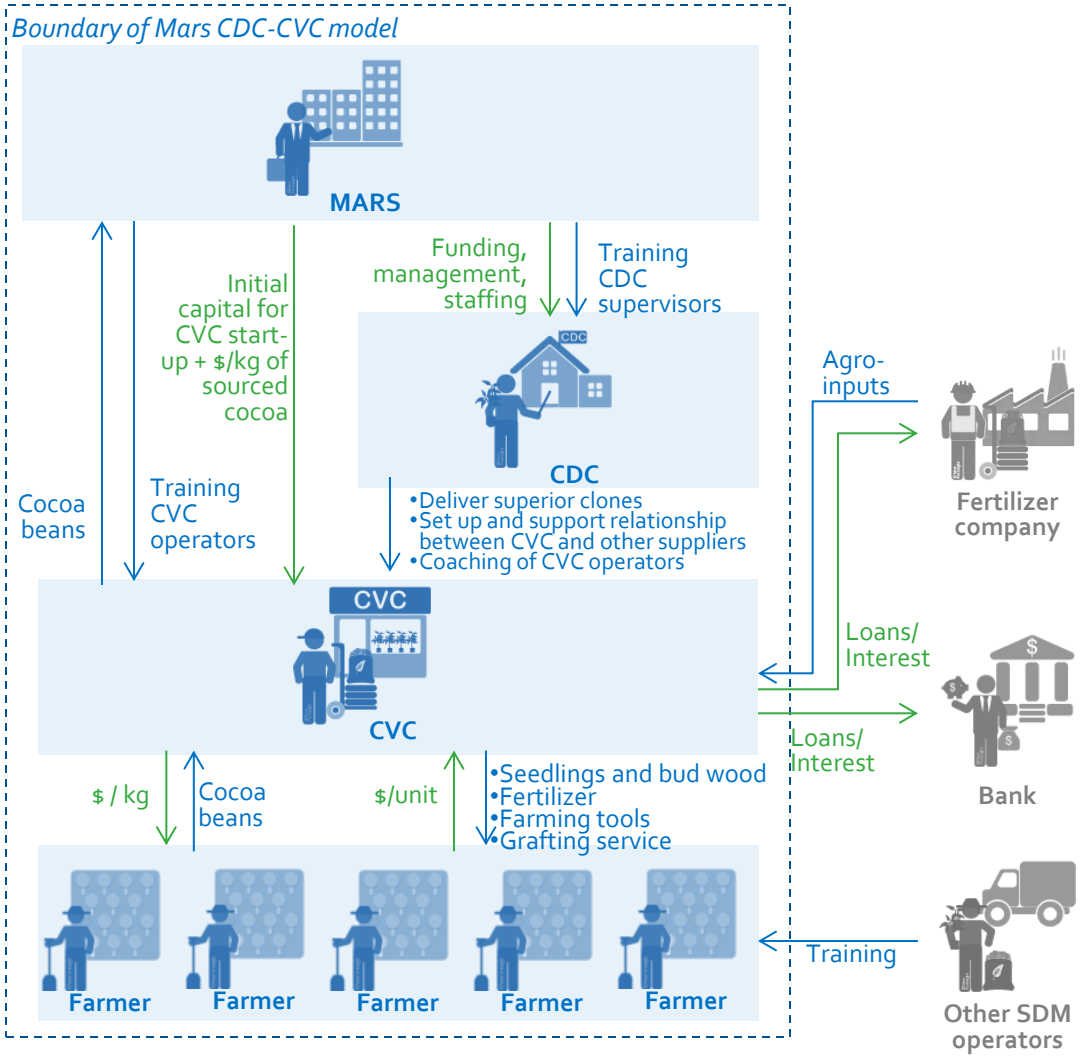
The objectives of the Mars SDM are to improve the yield and quality of the farm, and as a result: increase farmer income.

These objectives are achieved by enabling access to training, agro-inputs and services for farmers through the CDC-CVC extension outreach system.

Mars mainly targets farmers with a high improvement potential and that have already been trained by 3rd parties. This implies that farmers should have the capacity to make a small investment in their own farm, making for a 'self-selection' mechanism. This small investment also becomes the key to unleash productivity potential.

Once the objectives of the SDM are met, they create a inertia within the actors that allows the success and rightful functioning of the program: increased productivity and farmer income contributes to motivate the SDOs by building a demand for inputs and services.

Overview of services and revenue flow in the CDC-CVC system



The CDC-CVC network is designed to make the Triple Productivity Package (a set of productivity enhancing inputs) available to cocoa farmers:

- CDCs make available superior cocoa clones with on-location nurseries and budwood gardens, and distribute it through CVCs selling to farmers.
- CDCs set up and support relationships of CVCs with fertilizer and other input distributors and financial institutes, in order to help CVCs expand and strengthen their business.
- The training of farmers in Good Agricultural Practices (GAP) and Good Business Practices is being done by partner organizations (government extension services, NGOs etc.) prior or concurrent to CVC operations (unrelated).

The value chain investor (i.e. Mars or a franchise partner) funds the set-up and operational costs of CDCs as well as the initial start-up costs for CVCs. Mars provides the training of all CDC supervisors and CVC candidates - including those of franchise partners - at their Cocoa Academy. As of 2015 Mars will also be buying cocoa through their CVCs, with the CVC operators acting as collectors

Legend

←Flow of goods and services →Cash flow

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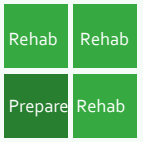
Time line and critical path of interventions and scaling up the system

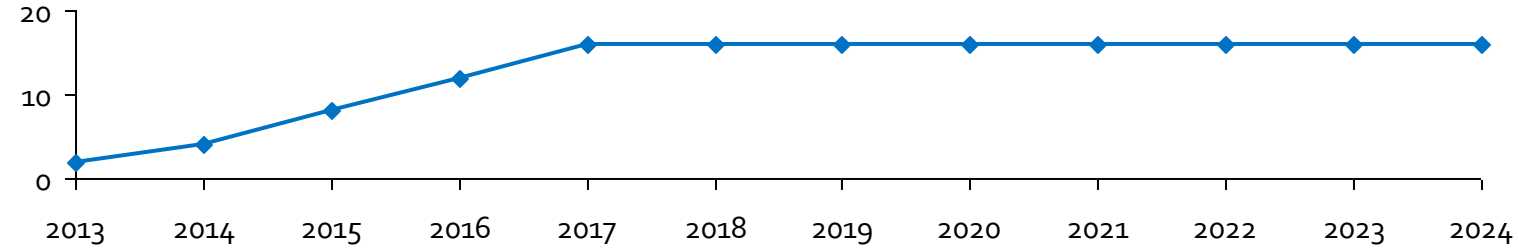
The table below illustrates the activities timeline during the first 6 years for all the SDM actors. For the CDCs, the critical path is indicated.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6 onwards
 Mars/ CDC	• Set up CDC • Supervisors trained • Recruit 10 CVC candidates	• Start M&E • Support set up of 10 CVC • Recruit 10 CVC candidates	• Coach/refresh training • M&E • Support set up 10 more CVCs • Recruit 10 candidates	• Coach/refresh training • M&E • Support set up 10 more CVCs	• Coach/refresh training • M&E	• Coaching/ refresh training • M&E
 CVC	• Discussions, preparations	• Set up CVCs • Link first 20 farmers per CVC	• Set up CVCs • Link 40 new farmers per CVC	• Set up CVCs • Link 40 new farmers per CVC	• Expanding business, full productivity package	• Expanding business, full productivity package
 Farmer		• Study demonstration • Prepare 25% of farm for rehabilitation 	• Rehabilitate prepared part of farm • Prepare 2nd part of 25% of farm 	• Rehabilitate prepared part of farm • Prepare 3rd part of 25% of farm 	• Rehabilitate prepared part of farm • Prepare 4th part of 25% of farm 	• Fully rehabilitated cocoa farm 

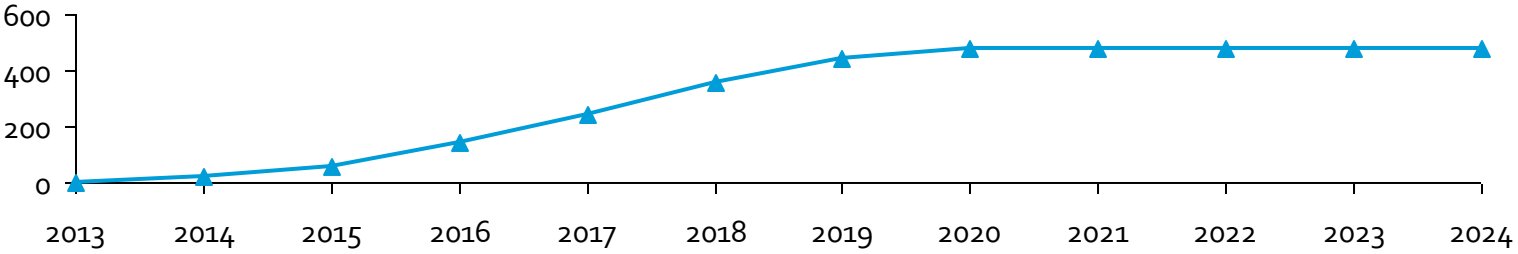
Mars' scale-up projections for the CDC-CVC model over time

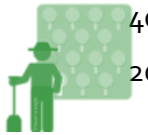
The plots and the table below show the scale-up projections over the next 10 years, accounting the total number of CDCs, CVCs and farmers that are part of the program.

Total CDCs

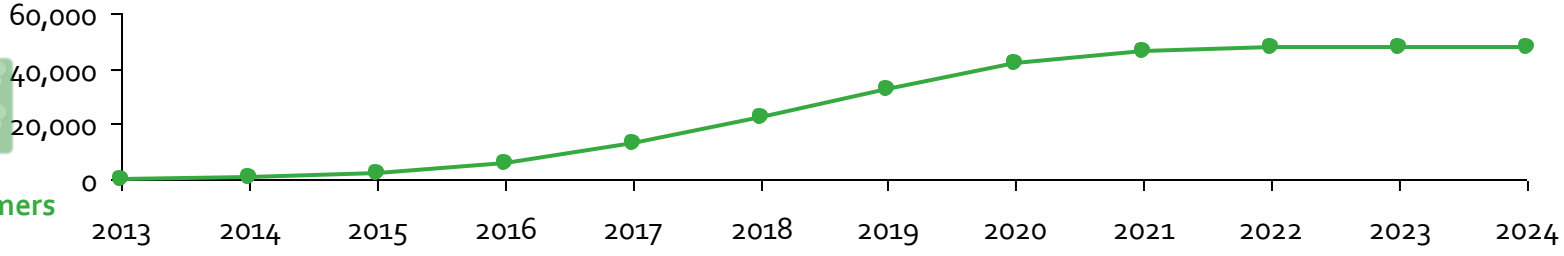


Total CVCs



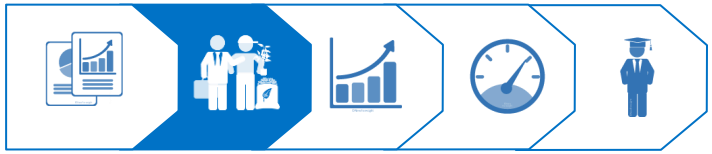


Total farmers



	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Total CDCs	2	4	8	12	16	16	16	16	16	16	16	16
Total CVCs	0	20	60	140	240	360	440	480	480	480	480	480
Total farmers	0	400	2,000	6,000	12,800	22,400	32,800	41,600	46,400	48,000	48,000	48,000

Services delivered by the VCI and the SDOs as part of the SDM



Types of services delivered within the boundaries of the SDM by the Value Chain Investor and the Service Delivery Operators

The table below presents an overview of the services delivered by the Value Chain Investor and the Service Delivery Operators by type of service. Further details are given in the following pages.

	Value Chain Investor	Service Delivery Operators	
			
Type of services	Mars	CDC	CVC
Training & capacity building	• Training of the Cocoa Doctors in the Mars Cocoa Academy	• Advise and support to the Cocoa Doctors • Coach and monitor CVC operators	
Input supplies			• Seedlings and grafts • Cocoa-specific fertilizer • Phyto-sanitary products and farm tools
Business & market outreach	• Buy cocoa though the CDC-CVC structure		• In the future, a cocoa collection center from the farmers they serve
Certification	• In the future, certification around the CDC-CVC structure and ICS system		• In the future, certification agent
M&E		• Data gathering for the M&E system	

Services provided by the Value Chain Investor

Mars as the Value Chain Investor coordinates the overall CDC-CVC structure centrally from the Mars Cocoa Academy. Details and costs are explained below.

The Mars Cocoa Academy

- The central entity in the system is the Academy, where all Cocoa Doctors are trained to become CDC or CVC operators and from where the entire structure is managed and monitored.

Mars buying cocoa through the CDC/CVC structure

- As of 2015 Mars will be buying cocoa through their CDCs, with the CVC operators acting as collectors.
- Mars is also planning to build a certification around the CDC/CVC structure, constructing an ICS system that will be maintained by the CDC and its CVCs. The CVC operator would receive part of the premium.

Exit strategy

- Mars' exit strategy is limited to the CVCs, that are supposed to become self-supporting upon establishment.
- The company will remain involved in the monitoring of the structure through their CDCs, who will continue to coach CVCs and will be able to withdraw their Mars affiliation upon malpractice.
- Mars also remains very active in the promotion of fertilizer through the CVCs, brokering an attractive deal for the CVCs to sell cocoa-specific unsubsidized fertilizer as sponsored agents of a fertilizer company.

Investment & operating costs:

The Mars Academy operating cost is **$350.000**.

Variable cost associated with training the Cocoa Doctors are **$1.500** each.

Revenue

Mars makes an extra margin of **2%** versus buying cocoa off the market due to better bean quality (industry estimate).

Additional savings could be made by reducing high-cost emergency purchases due to supply shortage.

Services delivered at the Cocoa Development Centers

The CDCs are service delivery operators that coordinate groups of CVCs. Details and costs are explained below.

The Cocoa Development Center

- The CDC is a demonstration and training/coaching site managed, permanently staffed and funded by Mars or one of its trade partners

The role of the CDC today

The CDC manager is trained as a Cocoa Doctor but with additional higher academic and practical training to ensure competence and credibility to advise the Cocoa Doctors. The CDC manager is a Mars associate with proven skills and competences that is tasked with managing the CDC demo farm securing an ongoing supply of high quality budwood to the 30 CVCs they manage, as well as acting as intermediary versus the fertilizer supplier.

CDC managers are also tasked with coaching the CVC operators into higher performance and monitoring them closely (including data gathering for the M&E system)

- *Note:* The investment and operating cost of a Mars CDC used in this study represents the 'gold standard' and assumes a built up without existing buying infrastructure. Therefore, these costs are significantly higher than for Franchise CDC that usually make use of existing infrastructure.

Investment & operating costs:

Initial investment costs to establish a CDC are **$52.000.**

The annual operating costs per CDC are **$30.200**, including:

- CDC staff (salary, allowances, insurances and phones): **$27.300**
- Land lease, electricity and water**: $2.900**

Services delivered at the Cocoa Village Centers

The service delivery operators reaching directly the farmers are the CVCs. Details and costs are explained below.

The Cocoa Village Center

- The **CVC** is an economically independent enterprise close to the village where a "Cocoa Doctor" supports other farmers.

The role of the CVC

- The CVC operator runs a high-quality productivity **demo plot** (the WOW farm), that Mars helps him plant through the CDC. He also runs a **nursery** of high quality planting material that he uses to supply his farmer seedlings and grafts.
- The CVC operator acts effectively as an agent for a fertilizer company, supplying his clients with **cocoa-specific fertilizer** starting in 2015. The carrying cost for the fertilizer is borne by the fertilizer company, with the CVC paying a cumulative "penalty" of 1% for each month that the fertilizer is not sold (1% in month 1; 2% in month 2 and so on; for the purpose of this study averaged at 2%).
- Finally he makes money off of selling **phyto-sanitary products** and **farm tools**.
- The knowledge that the CVC operator is expected to transmit to his farmer clients is provided for free, and is envisioned as a form of marketing to secure a client base.
- When Mars has its buying structure operational it will **collect the cocoa from the farmers** they serve, with Mars expecting CVCs to source an average of 60% of the total crop of CVC clients.
- From the ICS that will eventually be set up to use the CDC/CVC as **certification agent** they will collect some revenue ($10 per farmer – not visualized on the following slide).
- Some CVC operators are proving highly successful and are taking up an entrepreneurial role, hiring additional Cocoa Doctors to set up additional CVCs. Mars is exploring whether this model can be replicated or is solely contingent on the exceptional skills of a few individuals.
- Mars has specifically chosen to refrain from training collectors as Cocoa Doctors, instead focusing primarily on the ability of a Cocoa Doctor to act as a knowledgeable and reliable broker of knowledge and inputs.

Investment costs:

The value chain investor (Mars or franchise partner) covers the investment costs for CVC infrastructure of **$3.400**:

- WOW Farm (100 trees) incl. budwood garden: **$160**)
- Nursery (6x9m, capacity 1.500 seeds): **$560**
- Fertilizer & agrochemical Storage (6x6m): **$2,700**

Tools, business registration and communication material are also provided: **$360**

Operating costs

The CVC operator carries the operating costs of the business:

- Interest rate pre-financed agro-inputs: **2% of sales cost**
- Plant material: **$0,10/tree**
- Infrastructure depreciation and maintenance: **3%**
- Cost of his own cocoa farm

Revenue

- Agro-input sales: **$40/mt**
- Grafting services**: $0,40/tree**
- Cocoa trading (industry estimate): **$20/ton**
- Revenue from own farm

The client base of the CVC

As relevant information for the CVC operations, the characteristics of its client base are described.

The client base of the CVC

- Each CVC is supposed to have a client base of 100 returning farmers, building it up throughout the years (20 in the first and 40 for each of the two next years).
- Farmers are supposed to be selected by the CVC operator as potential high-productivity farmers to reach maximum impact for the model and ensure successful uptake of the inputs.
- Mars has not yet developed a methodology for targeting the most promising clients for a CVC, and is currently focusing on reaching the number of 100 clients per CVC.
- CVCs are positioned a maximum 20km from a CDC in cocoa communities of around 500 inhabitants, focusing on high production areas (in areas in Luwu close to the Mars Academy).

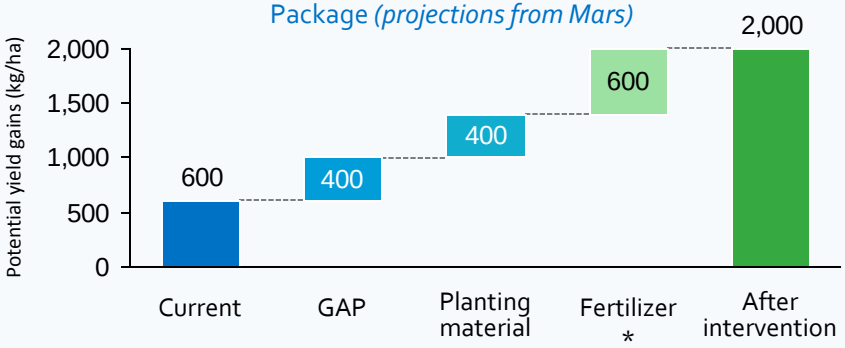
Impact of the SDM at farmer level (1ha farm)

The expected impact of the services delivered within the boundaries of the SDM at farm level is illustrated using a 1 hectare farm as reference.

Getting the farmer to reach (and surpass) 2000kg/ha

- Mars expects the impact of their "triple productivity package" to have its full effect through a cycle whereby the farmer replants/grafts 25% of his farm each year, starting his interaction with the CVC.
- The diagram below lays out the impact of the components of the "package" towards 2000kg. In practice the impact can be higher and productivity calculations are based on a peak production of 2500 (in year 8 after starting rehabilitation) before the productivity of the aging trees leads to a net decline again.
- Farmers are expected to be trained by other stakeholders in the local cocoa eco-system, be they capacity building programs of the Government, NGOs or processor/exporters.
- In some areas Mars cooperates with local extension workers from the government to secure buy-in of the local farming population (rather than for the effectiveness of their service provision).

Expected gains in productivity after applying the Triple Productivity Package *(projections from Mars)*



** Fertilizer is necessary on all intervention levels. Without fertilizer, the impact of GAP and Plant Material are limited and for a short time*

Costs of farming:

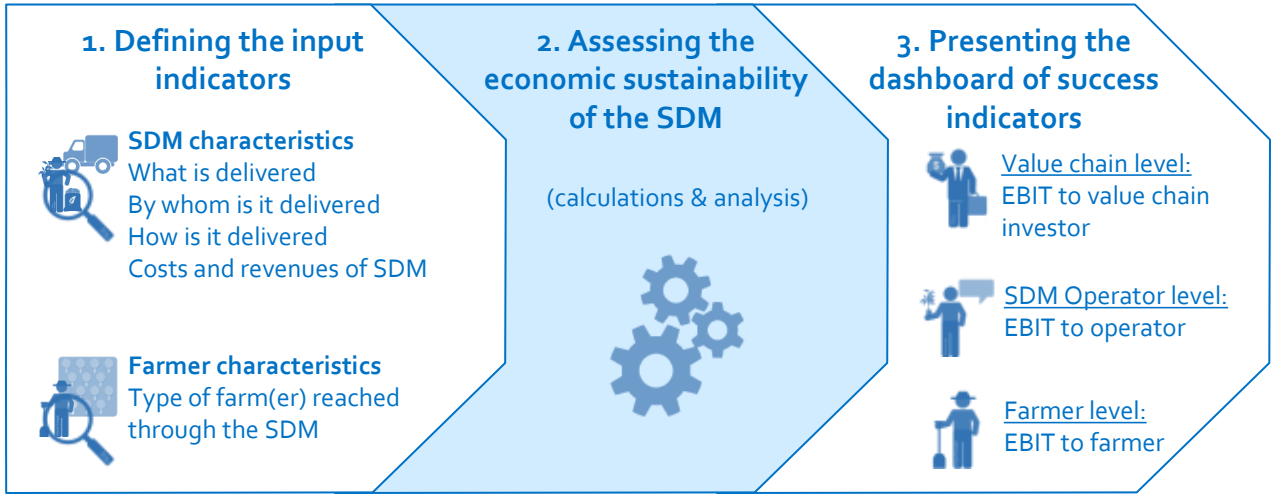
- Farm labor (**$4.80/man day**) related to development costs (replanting/grafting), maintenance (herbiciding, fertilizing, circle weeding, and pruning & sanitation), and harvesting
- Costs of fertilizers: annual average of **$320**
- Phyto-sanitary products: annual average of **$60**
- Seedlings or budwood/grafting services: annual average of **$75**.
- Tools (pruner pole, side grafting knife, chainsaw, handsprayer)

Revenue from cocoa farming:

- Revenues from cocoa sales. This study uses a farm gate price of **$2.400/ton of dry beans** (IDR 30.000/kg)

Economic sustainability of the SDM

Assessment of the economic sustainability of the SDM



After defining the different services delivered through the SDM, and studying the variables for each one of the cases, the economic sustainability of the model was assessed through the analysis of the economic performance of all the actors.

This analysis included:

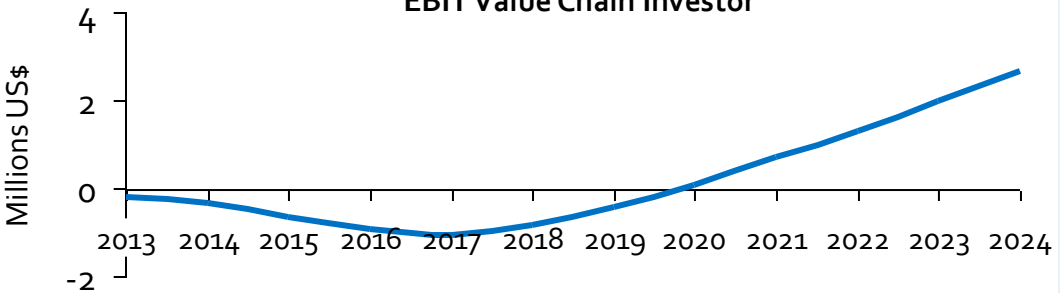
- Calculation and comparison of earnings before interest and taxes (EBIT)
- Study of the cash flows the relevant actors in the model
- Study of the reported impact of the SDM on an average farm

The findings of this analysis are presented in the following pages.

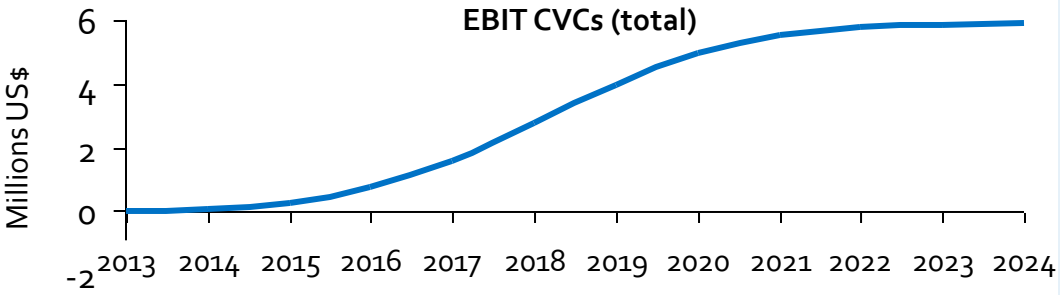
Overview of profits for VCI, CVCs and farmers

Projections of the expected profits for the Value Chain Investor, the total CVCs and the number of farmers participating in the program over a 10-year period is given below. This data is based in projections.

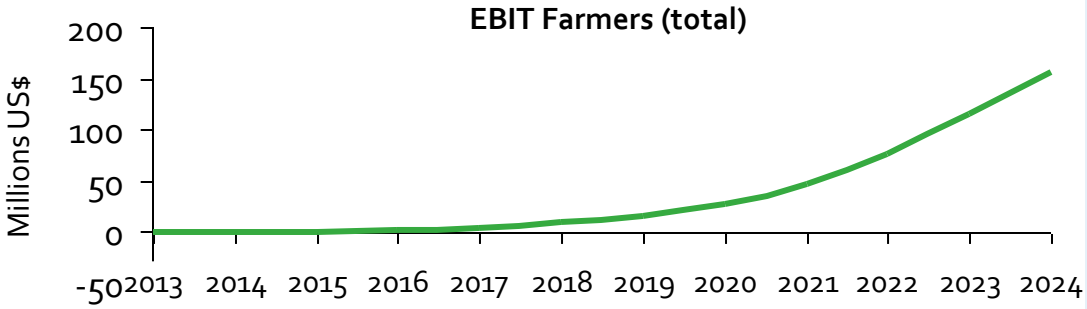
Value Chain Investor



Total CVCs



Total farmers



Earnings before taxes and interest (EBIT) for each SDM actor

EBIT at the value chain investor level

- This is the total sum of costs and earnings of Mars and its value chain partners over the course of the SDM's implementation.
- With the SDM sticking to its scale-up plans Mars and its value chain partners would reach a positive EBIT after 8 years. According to the projections, it will take until the 12th year (2024) after a start in 2013 before the value chain investors have earned back their initial investments in the SDM.

EBIT at the operator level

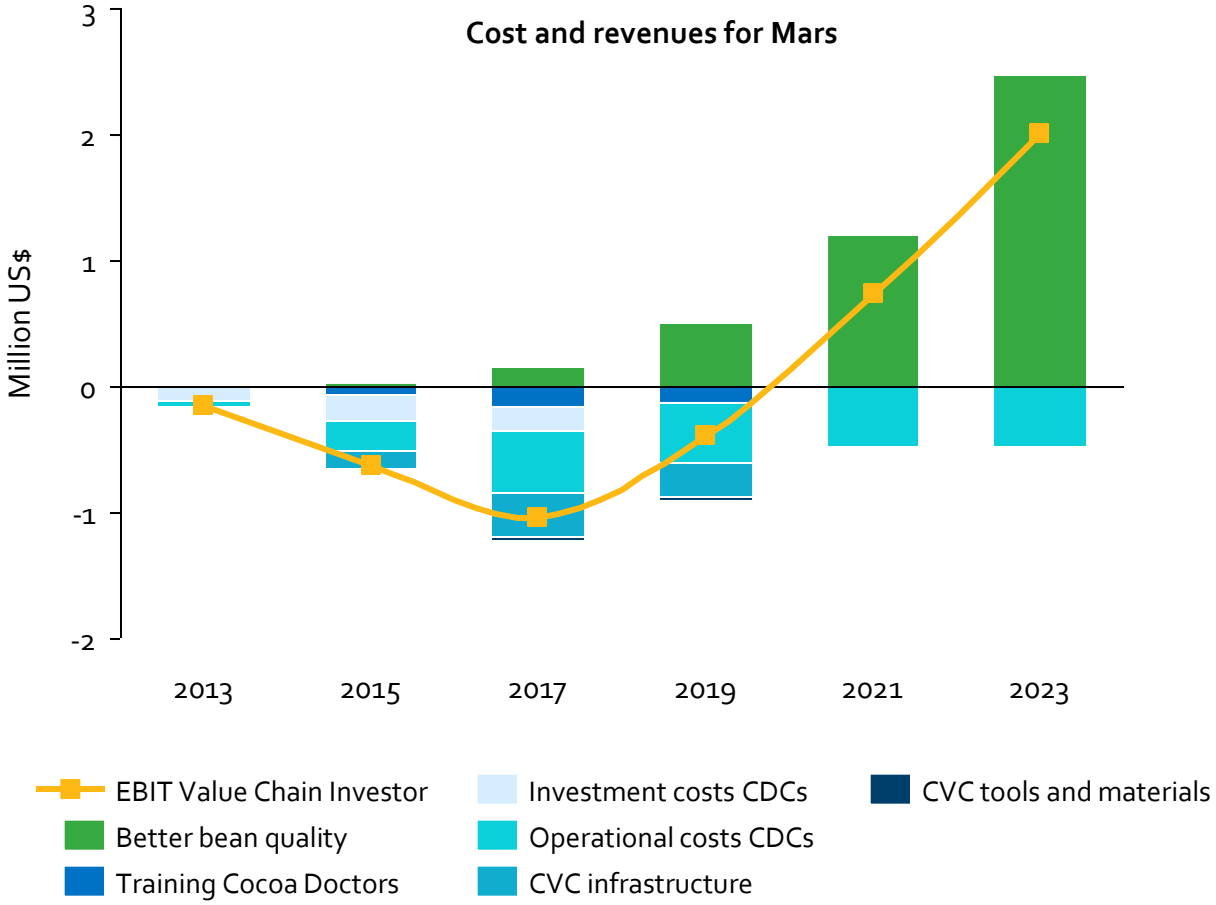
- This is the total sum of costs and earnings of all 480 CVCs operating over the course of the SDM's implementation.
- The CVC curve flattens towards the end as a result of the 100 client farmers per CVC having fully rehabilitated.

EBIT at the farm level

- This is the total sum of costs and earnings of all 48,000 farmers that are clients of CVCs over the course of the SDM's implementation.

Overview of costs and revenues at Value Chain Investor level

The business case for the Value Chain Investor is presented below. The costs for the CDC-CVC system are the expenses, while revenues come from improved bean quality. The data presented is based on projections.



Economic sustainability at value chain investor level

Main revenue drivers

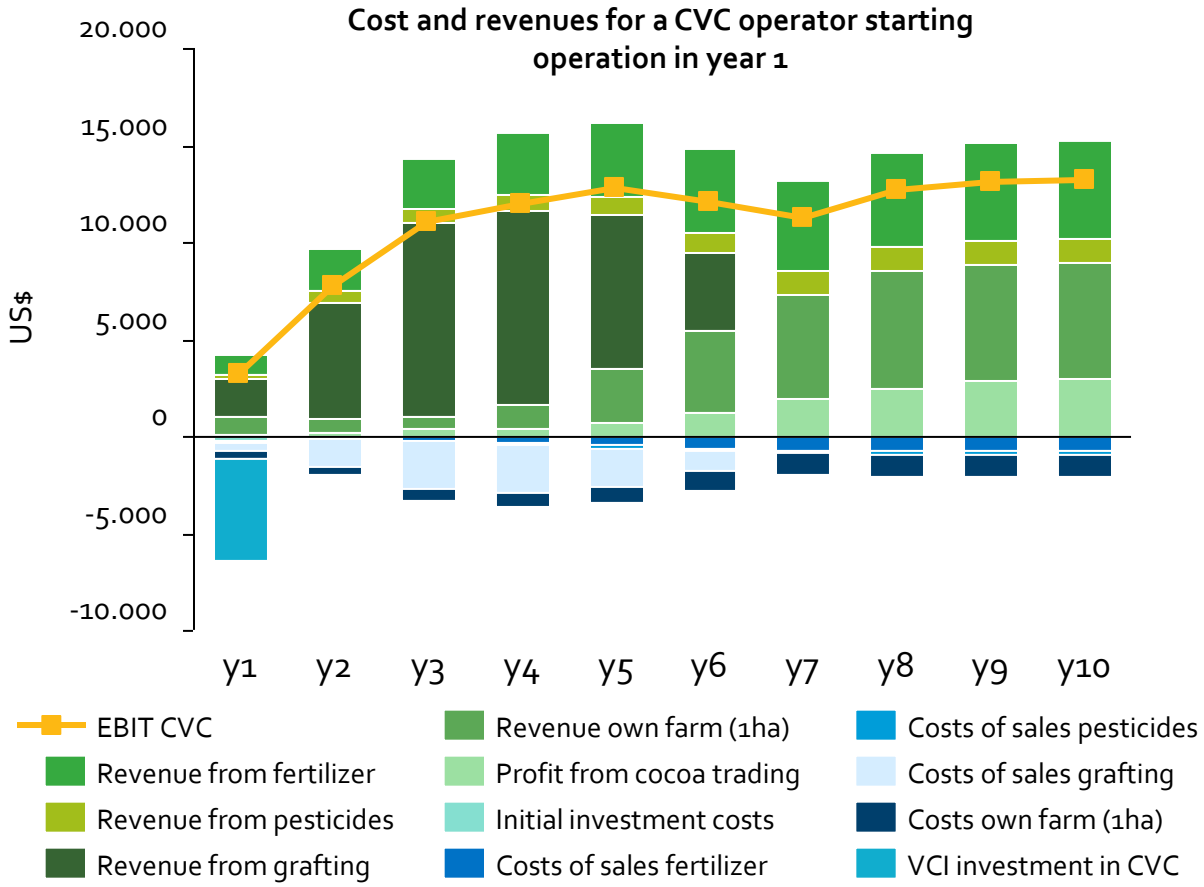
- As of 2015 Mars will buy cocoa through their CVCs. How much of their produced cocoa is sold by the farmers to the CVC will depend on the trust and frequency of contact between the CVC operator and farmer, amongst other things (estimated at 60% of all beans produced).
- Mars expects to benefit from the better quality of cocoa beans produced by the farmers in the model, resulting from better farming practices and the use of improved varieties. Beans will contain more fat, be larger in size, and less 'contaminated' with waste. As a conservative industry estimate this could lead to 2% higher margins.
- By sourcing cocoa through the CVC operators, Mars will also be better able to smoothen its bean supply over time.

Main cost drivers

- The main cost driver for the value chain investors in the CDC-CVC model is the annual operating costs of the CDCs ($30.200/year per CDC). This is an ongoing investment. Investment costs for CDCs ($52.000/CDC) and CVCs ($5.300/CVC) are also substantial, but one-time only.

Overview of costs and revenues at CVC Operator level

The business case for a CVC over 10 years is presented below, illustrating the profits the Cocoa Doctor can obtain from running an average CVC starting operations in year 1. The data presented below is based on projections.



Economic sustainability at operator level

Main revenue drivers

- The revenue of a CVC business is highly dependent on the number of farmer clients that adopt the entire productivity package at a rapid pace. In practice the client base will be wider and more diverse in their demands.
- Grafting is key to the farmer's profitability. Assuming this swift ramp-up the CVC would have to wait for a similar boom during the next replanting cycle.
- It is assumed that the cocoa doctor will continue a focus on his farm rather than purely becoming a commercial seller of inputs and services.

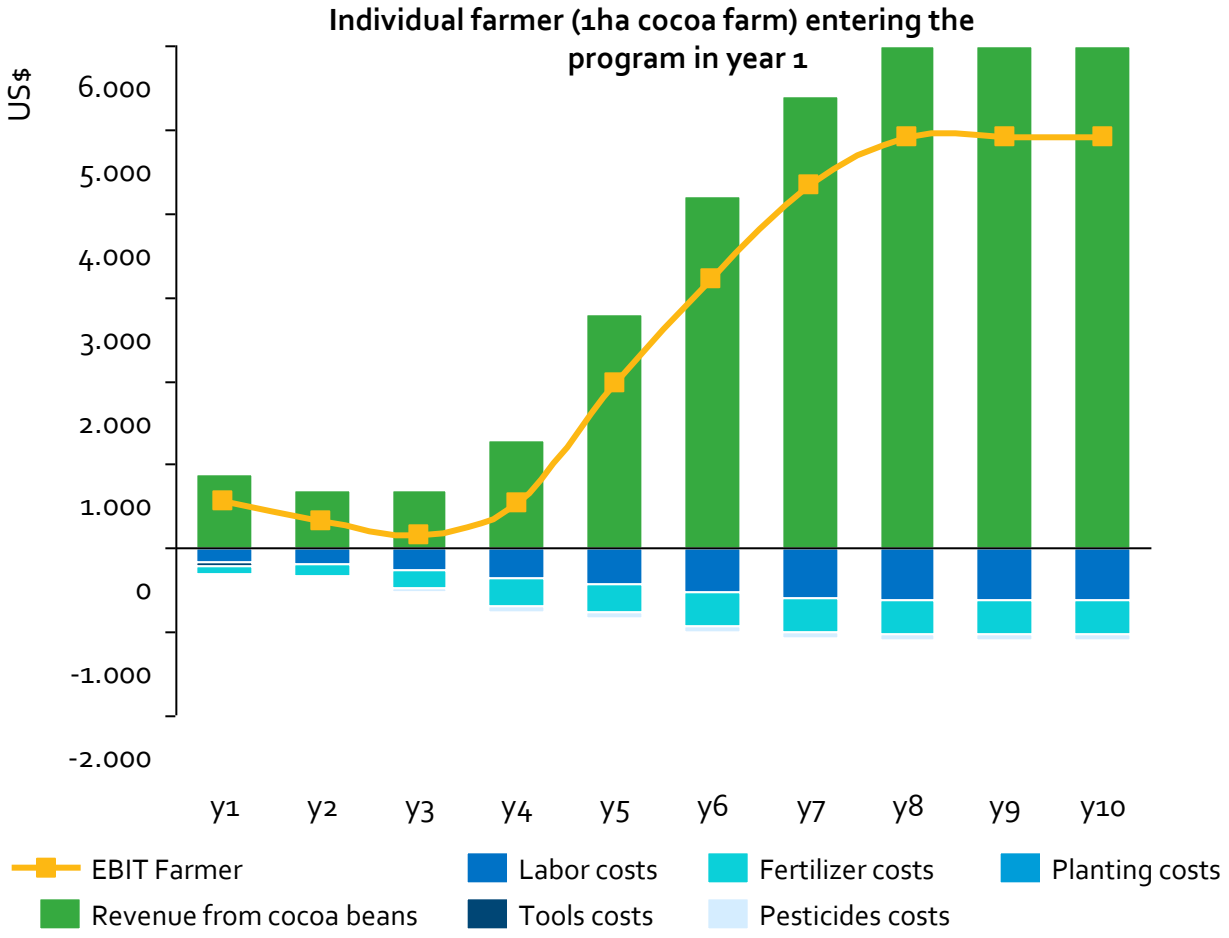
Main cost drivers

- When a CVC operator has difficulties in selling his/her fertilizer, this can drive the total costs significantly since he will need to pay a cumulative "penalty" of 1% for each month that the fertilizer is not sold (1% in month 1; 2% in month 2 and so on)

Note: *This graph excludes the additional benefits of certification ($1,000 upon operationalization of ICS)*
VCI investments in CVC infrastructure are meant to be temporary as Mars currently seeks banking services recover this

Overview of costs and revenues at farmer level (1ha farm)

The business case for an average farmer with a 1ha farm is given below. The projected revenue is calculated based on the expected yield increase.



Economic sustainability at farm level

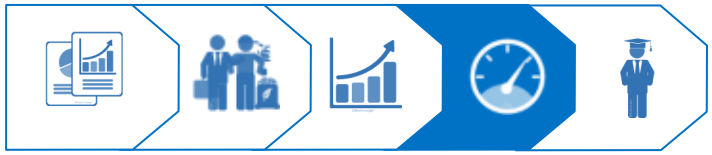
Main revenue drivers

- Mars expects the impact of the "triple productivity package" to have its full effect through a cycle where the farmer replants/grafts 25% of his farm each year, starting his interaction with the CVC.
- This would lead to a productivity increase to 2.5 ton/ha after complete rehabilitation and under the assumption the farmer adequately applies GAP and the right type of fertilizer.
- If the different interventions don't come together (e.g. because the farmer does not buy fertilizer) impact will be much lower.

Main cost drivers

- The main cost driver is labor, which will increase substantially when applying GAP and managing the increase in production. In this scenario – during the peak production years (from year 8 onwards) the farmer will spend around 65 days on maintenance and 63 on harvesting per year.
- Fertilizer costs make up 40% of the total costs of a farmer once he has fully rehabilitated his farm, making it the second largest cost driver. Changes in fertilizer prices will have a big effect on the total costs for the farmer.

Dashboards



Definition of the key ratios and indicators presented

The key ratios and the indicators presented in the following pages are defined below.

1. Cumulative investment requirement ($ millions)

The cumulative investment requirement is the total sum of the amount of money that is required as an investment for the SDM to operate per year over the program period. If the cumulative investment reverts to zero, this indicates that the initial investment is recouped. A positive cumulative investment indicates a positive return on investment.

2. Max cumulative investment requirement ($ millions)

The maximum cumulative investment requirement is the average amount of investment per year needed over the total program period (12 years).

3. Payback period of initial VCI investment (years)

Payback period of the initial VCI investment refers to the length of time required for the VCI to recover its initial investment or to reach breakeven point. After this point if time, the SDM becomes profitable for the VCI.

4. Investment level per kg produced (%)

The investment level per kg produced is the total amount of money invested in the SDM as a percentage of the total volume of the cocoa produced in the program quantified at the price paid to the farmer at farm gate.

5. Investment level per kg uptake (%)

The investment level per kilo uptake represents the total amount of money invested in the SDM as a percentage of the total volume of the cocoa traded through the program quantified at the price paid to the farmer at farm gate.

6. Farmer profit per $ investment ($)

This ratio indicates the amount of earnings received by the farmer after being part of the SDM program in relation to the amount of money invested initially.

7. Payback period of farmer initial investment farmer (years)

Payback period is the length of time needed to recover the initial investment made.
Payback period for farmers is calculated for all farmers in the program combined (regardless of particular situations); payback period for individual farmers might be shorter.

8. Productivity gain by year 10 (%)

The productivity gain indicates the increase in productivity obtained by an average farmer participating in the program in the year 10 of intervention, considering as 100% or baseline year the average productivity obtained without the SDM intervention.

9. Total program EBIT/kg ($/kg)

This ratio represents the sum of all the earnings before interest and taxes perceived through the program divided by the total amount of cocoa produced with the support on the SDM. Higher EBIT/kg indicates higher profitability. This ratio is also given as a percentage of the price paid to the farmer at farm gate.

10. EBIIT/kg with 20% interest on funding ($/kg)

This ratio represents the sum of all the earnings before interest and taxes perceived through the program while applying a 20% interest as cost of capital divided by the total amount of cocoa produced with the support of the SDM.

11. Loyalty uptake in year 10 (%)

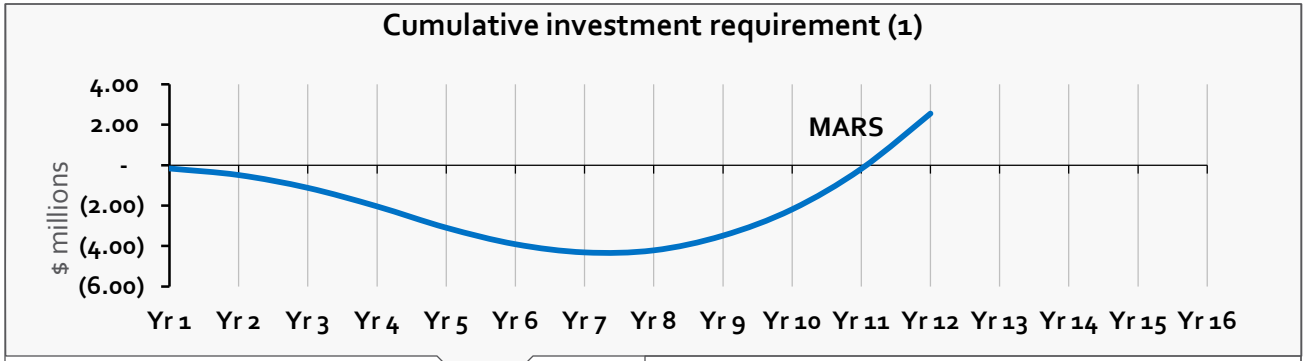
The loyalty uptake in year 10 is the percentage of the cocoa that is traded through the CVCs by year 10. The rest of the cocoa is sold by farmers to middlemen.

12. Payback period full program VCI-SDO-farmer (years)

Payback period full program is the length of time required by the different actors (VCI, SDO, farmers) to recover their initial investment.

Dashboard Investment requirement and key ratios

Key ratios and KPIs are presented in the dashboard below. The definition of each one of these indicators is detailed on the previous page.



INVESTMENT REQUIREMENT

Max cumulative investment requirement (2): $4 M

Payback period of initial investment for VCI (3) : 12 years

Investment level per kg produced (4) 0.5%

Investment level per kg uptake (5) 0.8%

Farmer profit per $ investment (6) : $30

Payback period of farmer initial investment (7) : 6 yrs

Productivity gain by year 10 (8): 400%

KEY RATIOS

Total program EBIT / kg (% of market price) (9): $0.60 / kg (20%)

EBIT / kg with 20% interest on funding (10) : $0.59 / kg

Loyalty Yr 10 (uptake %) (11): 60%

Payback period full program (12): 11 Years

The Mars SDM is self-financing over the course of the program

The Mars model, after an initial investment requirement of $4m, recoups this initial investment through better quality beans.

From the perspective of farmer development, the Mars model generates $30 for every $1 investment respectively.

Sensitivities dashboard: risks and opportunities

The table below contains the definitions of the key levers analyzed on this dashboard. It also contains an assessment of the risks and opportunities based on the combined likelihood and impact.

Key levers	Risks	Opportunities
Farmer productivity Farmer productivity refers to the (assumed) development of farmer productivity over time as a result of the program.	! ! !	✓✓
Input costs Input costs refer the costs of inputs to the farmer over time as a result of their participation in the program	! !	✓✓
Effective yield/kg raw product Effective yield final product / kg raw product refers to the extra margin that Mars can realize as a result of selling beans that have a higher quality due to farmers' participation in the program	! !	✓✓
Uptake Uptake refers to the share of their total production that farmers participating in the program sell to CVCs participating in the program	N/A	✓
Finance costs Finance costs refers to the cost of capital that is incurred on the investments that are made by Mars in order to set up the program. For the purposes of the sensitivity analysis we have applied a straightforward annual interest rate on the cumulative investments that are outstanding in each year to discover at which interest rate percentage the profitability of the program reduces to zero. Note that the profitability of the VCI may reduce to zero at a different interest rate.	!	N/A

Legend:
! ! ! high risk
! ! medium risk
! low risk
✓✓✓ high opportunity
✓✓ medium opportunity
✓ low opportunity

[1] Initial assessment of key risks and opportunities. These have not been tested with or verified by MARS

Sensitivity analysis reveals the areas of opportunity and risk for the SDM

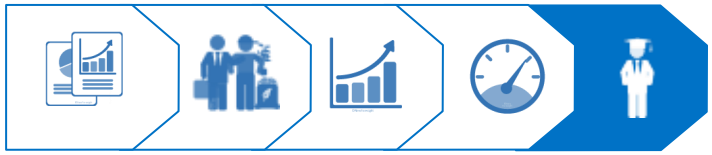
Relatively minor improvements in selected key ratios can significantly improve program profitability (EBIT / kg +20%)

Conversely, profitability may be compromised (EBIT / kg to zero) as a result of a few risks that are deemed likely to occur

In the case of MARS, it can be observed that:

- The key risk for the Mars SDM is that productivity gains do not reach the ambitious targets
- If these targets are exceeded, this would be the key lever for improving model profitability
- A further risk is that input costs rise; while the model as a whole remains profitable, the payback period for farmers increases

Conclusions and lessons learned



Conclusions: key drivers for success and key risks

In interviews with project staff a number of hypotheses with regards to key drivers for sustainability and scalability of the SDM were discussed as well as the risks of the model and how these could be remedied. Findings are presented below.

Key drivers of success

→ The Mars model is highly demand-driven. The idea is that through a combination of self-selection of farmers and cherry-picking of the better/most promising farmers by CVC operators the provided inputs and knowledge will first reach those farmers that are capable of swift adoption which will establish a viable business for the CVC operator. Next, the CVC operator will target farmers typified as 'middle adopters' whom will require more support and more time to rehabilitate their farms. There would be limited "leakage" of these inputs to less capable farmers. Ideally the success of CVC clients will have a sector-wide demonstration effect.

→ Through tying the model to its commercial structure Mars has identified a potential source of revenue for the model that would make it very profitable for the value chain investor. However, the exact business case for this is still under development, and how it functions in practice (whether indeed high farmer loyalty to the extent of 50% procurement of total CVC client production can be achieved) remains to be seen. Already some of Mars trade partners are setting up CDCs and CVCs, demonstrating faith in the commercial potential of the model.

→ The model was conceived and built on making cocoa competitive and attractive compared to other crops at a time of fairly low cocoa prices (2,000 US$/ton at farm gate). Higher cocoa prices will stimulate farmers' interest and could increase the success of the uptake of productivity interventions promoted by the CDC-CVC model.

Key risks

→ The Mars model is based on the idea that many farmers exist in the area of operation of the model that are able and willing to invest in fertilizer and high quality planting material. As such it relies on training outreach by other stakeholders.

→ Similarly the model relies highly on the capability of CVCs to "push" these inputs to the farmer, supported by the required knowledge they need for grafting and proper application (additional to their existing GAP understanding).

→ The loyalty of the CVCs is a risk factor to safeguarding the high quality of materials and interventions. The only available sanction Mars has is to cut off CDC support and the connection to the Mars brand (through advertising signs at the CVC) and the bean procurement. The impact of this sanction could be limited in which case there will be uncontrolled CVCs that may not deliver against the high standards required.

→ It is unclear what will happen to the business model and quality of interventions of the CVC as the model scales beyond Mars and its' partners as such CVC's are beyond the monitoring and support systems of Mars and partners.

Lessons learned during the study exercise

Looking ahead at potential future phases of the study the consultant has identified some lessons from the case study to be taken into account in future replication of the study exercise, as well as some factors that will concretely determine what the value is of the current case study for replication by other stakeholders in other situations.

Lessons learned during the case analysis exercise

→ What is very positive is that IDH came in at the time that Mars was still building their model, without a fully functioning M&E system. Mars saw this as a good opportunity to internalize lessons from the study visit into their model and is willing to adjust its M&E system so it is both more useful to IDH for its purposes and for Mars to effectively benchmark its model against other SDMs. The assumptions and nature of the model were framed and can be monitored over time.

→ There are however little lessons to be learned from the model, as it is just starting its operations. Other stakeholders will only be able to benefit from the theory of the Mars model, not the lessons it has observed in practice, let alone validation of some hypotheses of what would constitute an effective SDM.

Key factors in replication of the model

→ What the CDC-CVC structure does is to bring expertise and inputs close to the farm gate, therefore overcoming issues of both infrastructure (not an issue in Indonesia) and input and expertise distribution failure (this is an issue in Indonesia). In Indonesia the infrastructure is excellent and farmers already have practices close to CVC requirements. Many farmers are indeed trained by other partners already. The cocoa market is also structured in a way that is highly beneficial to the farmer, who receives a high percentage of FOB and reaps much of the reward of increased productivity. The highly developed environment benefits the CDC-CVC model in Indonesia, however, the CDC-CVC model relies foremost on the attractiveness of highly productive cocoa farms vs other crops. Early indications are that CDC/CVC also work in West Africa.

→ The intangible factor is the nature of the Indonesian cocoa farmer, who has displayed a very entrepreneurial nature, leading to a swift transition to other crops in times of low cocoa prices but high adoption rates of practices and inputs in a high cocoa price environment (as is currently the case).

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About us

IDH accelerates and up-scales sustainable trade by building impact oriented coalitions of front running multinationals, civil society organizations, governments and other stakeholders.

Through convening public and private interests, strengths and knowledge, IDH programs help create shared value for all partners. This will help make sustainability the new norm and will deliver impact on the Millennium Development goals.

Mars, Incorporated is a private, family-owned business with more than a century of history and some of the best-loved brands in the world including M&M'S®, PEDIGREE®, DOUBLEMINT® and UNCLE BEN'S®. Headquartered in McLean, VA, Mars has more than $33 billion in sales from six diverse business segments: Petcare, Chocolate, Wrigley, Food, Drinks and Symbioscience. More than 75,000 Associates across 73 countries are united by the company's Five Principles: Quality, Efficiency, Responsibility, Mutuality and Freedom and strive every day to create relationships with stakeholders that deliver growth we are proud of as a company.

KPMG is a global network of professional firms providing high-quality services in the field of audit, tax and advisory. We work for a wide range of clients, both national and international organizations. In the complexity of today's global landscape our clients are demanding more help in solving complex issues, better integration and collaboration across disciplines and faster returns on their investments through value-added partnerships.

KPMG's Climate Change & Sustainability Services is a global team comprised of over 700 professionals who work in the field of climate change and sustainability – offering advisory, tax and assurance services to both public and private sector organizations.

NewForesight is a strategic consultancy that tackles the sustainability challenges of our time. Years of experience with sustainable market transformations led to a comprehensive theory and practical models that have the power to sustainably transform sectors. With a system approach our consultants come to the root of the problem and bring the sustainability ambitions of the client to the next level.

NewForesight is headquartered in the Netherlands, and our clients are based worldwide. To date, we primarily worked on sustainable market transformation in agricultural sectors such as coffee, cocoa, sugar cane, floriculture, aquaculture and cotton, for both public and private sector organizations.