Service Delivery Models

Insights for continuous improvement and farm impact

September 2016

the sustainable trade initiative

Contents

Preface

How can we deliver services to smallholder farmers to enable them to grow and prosper, and organize this in such a way that the market pays?

Cost-effective service models for smallholders has been a key focus in the work of IDH over the past 7 years. In the cotton sector we drove down the costs of farmer training from 135 €/MT in the first year to 4 €/MT currently, which has helped to scale our program (e.g. in amongst other places India, Pakistan and Mozambique) without compromising the quality of the training and impact on the farmer. In tea, we partnered with Unilever and the Kenyan Tea Development Agency in a service model that reaches over half a million smallholder tea farmers and has raised farm yields over 35% in Kenya. In cocoa and coffee primarily, but also spices, fruits and vegetables and other sectors, we are working with dozens of frontruning companies to prototype business models for efficient upstream supplier development. From these engagements, we know there is strong drive and innovation in the private sector, but positive impact on the farm is still limited and there is hardly any "management science" for optimizing service models for smallholders.

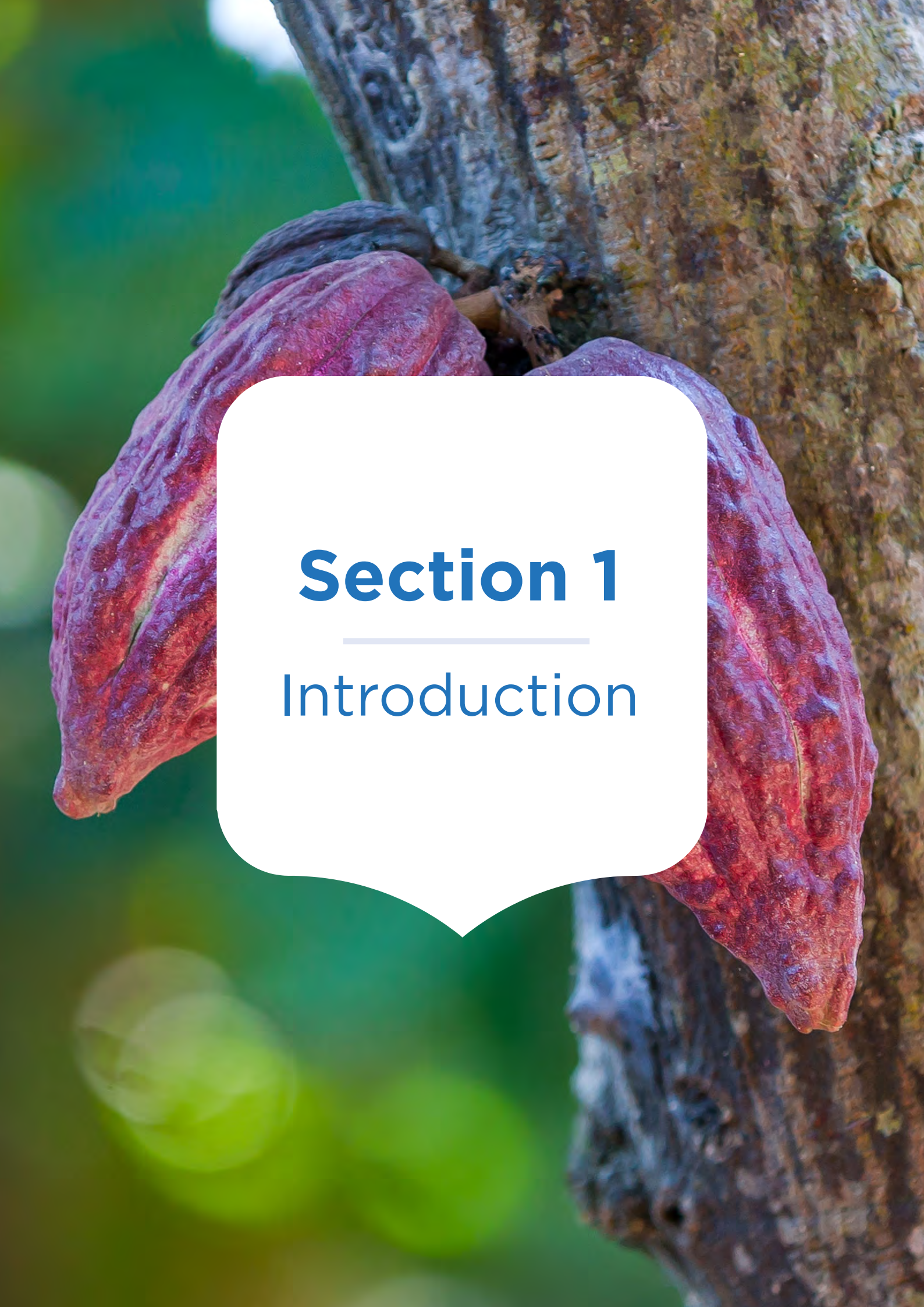
In response, we initiated a systematic, data-driven approach to understanding and improving service delivery models (SDMs) with ten key partners, both private sector and non-profit organizations in the coffee and cocoa sector. We developed a simple framework, which enabled our partners, for the first time, to oversee their supplier development activities in the form of a coherent business model and to assess performance with a number of standardized operational and strategic management parameters. This approach helped our partners get a holistic overview of their SDM and gain insight into the return on investment for both farmers with whom they are working, as well as their own business. The new insights inspired some of our partners to make direct changes in their model to further improve its performance.

We hope this report also inspires you to think differently about your current model of service delivery and challenges you to make improvements. We are committed to further advance the strategic insights and learnings on service delivery efficiency, by broadening the basis of SDMs that we have analysed and continuing to facilitate learning events where our partners can share and challenge each other. We will also continue working on prototyping innovations in SDMs with our front running partners, which we hope leads to breakthroughs in the cost-effectiveness and sustainability of SDMs. We invite you to join us in this journey!

We sincerely thank the partners that have participated in this study. We are grateful for the openness and willingness of our partners to share information and data on their model, and for their perseverance and eagerness to learn how to continuously improve. In the cocoa sector, we had the pleasure of analysing the service delivery models of Barry Callebaut, Cargill and PACTS in Côte d'Ivoire and Mars in Indonesia. In the coffee sector, we worked with Olam in Cameroon, TechnoServe in Ethiopia, ECOM and Tembo in Tanzania, the Hans R. Neumann Stiftung in Uganda and ECOM in Vietnam. We'd also like to thank the consultancies with whom we worked for their energy and dedication to this topic. Specifically, we'd like to thank NewForesight Consultancy and KPMG for developing the analytical framework, and NewForesight Consultancy for their strategic support and conducting the case studies that underlie this report.

Lucian Peppelenbos

Director Learning & Innovation,
IDH the Sustainable Trade Initiative



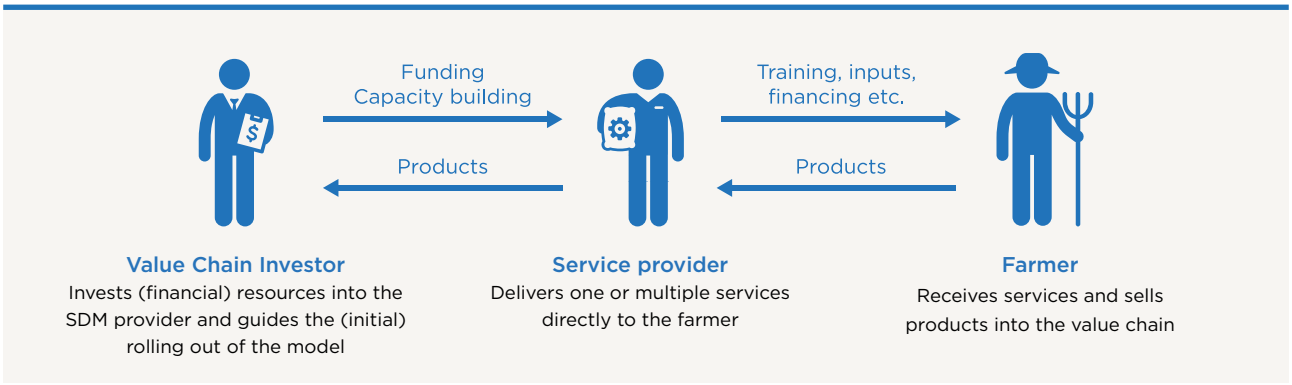
Section 1

Introduction

Introduction

1.1 What is a Service Delivery Model?

Service delivery models (SDMs) are supply chain structures which provide services such as training, access to inputs and financing to farmers to increase their performance and sustainability. The image below shows the roles of different entities in an SDM, although this can differ between the cases. The provider of the services is often the same entity that also sources crops from the farmer.



Modern agribusiness in developed economies is characterized by professional service delivery to the farmer supply base. In developing and emerging economies, this is a different picture; the market is less robust and public structures for service delivery are often non-existing or not well functioning. In this context, processors, traders and other originators of agri-commodities have started to develop services for their supplying farmers. This extension of company operations beyond the immediate core business is relatively recent and therefore still in search of best practice and cost-effectiveness. Many service models are not sustainable yet, as smallholder farmers are still left without access to the services they need.

1.2 Our vision

IDH, The Sustainable Trade Initiative is working, together with our partners, to address this issue, through a methodology that systematically analyses service delivery models and provides insights into the cost-effectiveness and economic sustainability. IDH uses these insights to increase the value creation for both business (more and secured supply) and the farmer (higher profitability and improved livelihoods). The data-driven methodology was developed together with KPMG and NewForesight Consultancy[1]. In the first year of the analysis, the economics of 10 delivery systems were reviewed, the results of which are presented in this paper. Based on the outcomes of this analysis, we aim to:

- Support supply chain managers in optimizing their service delivery to suppliers;
- Support investors in making informed decisions when investing in service delivery;
- Help shape models that create cost-effective impact on smallholder productivity and profitability, leading to improved farmer livelihoods.

1. The majority of the case analyses has been executed by NewForesight Consultancy

1.3 Approach

The focus of our analysis has been on the return on investment at three different levels of service delivery: the **(value chain) investor**, the **service provider** and the **farmer**. These three levels have been chosen because a sustainable model requires that all three main actors of the model receive a return on their investment. At each level, the costs and benefits of using and offering services were collected to calculate the return on investment.

Different scenario's were designed to gain insight into the key drivers for costs and benefits for farmers and service providers. To be able to benchmark different cases, a period of 8 years for each case was used, although some of the cases were operating for a shorter or longer time period. The analysis did not calculate the social return (e.g. community benefits) or environmental return (e.g. soil quality improvements or water usage reductions) because there is little quantitative data to support such analysis. Also, as most of the service providers are working with sustainability standards that are geared towards measuring social and environmental impact, we expect that certain social and environmental criteria are already being addressed. An example of a case that focuses on environmental impact is shown below, in case highlight 1.

Case highlight 1: Ecom Vietnam - environmental impacts

In early 2016, Vietnam experienced an extremely hot and dry season, resulting in declining yields and lower quality coffee. The Ecom Vietnam model addressed such environmental challenges by focusing services on making farmers more resilient to climate change, and limiting the negative environmental impacts of their farming practices. Specific attention was paid to environmental impacts of production in the training on Good Agricultural Practices (GAPs). Through the adoption of GAPs, the farmers were able reduce their environmental impacts significantly: 13% fertilizer use reduction resulting in better soil health, almost 50% pesticide use reduction, and 33% water use reduction. In addition, the model offered farmers the opportunity to buy shade tree seedlings. These shade trees improve the soil conditions (nitrogen fixation, moisture conservation and erosion control), provided a habitat for biodiversity on the farm, and increased the resilience and adaptation of coffee farms to climate change. The shade trees also offered opportunities for additional, more stable, farmer income from products such as timber and fruits.

1.4 Data availability

Key takeaways

- Only 3 out of 10 models base their projections for 100% historical data.
- Data collection and management is costly, but all companies are investing in data systems as they increasingly value data to guide SDM strategy and operations.

Throughout the analysis, the availability of data on the performance of the business models was a limiting factor. Almost all cases had solid data on the costs and revenues of their service model, as these need to be accounted for vis-à-vis their investors, but the number of cases with real data at farm level was low, and only in three cases historical data was available to calculate impact projections. As such, the analyses here are partly based on projections by the service providers.

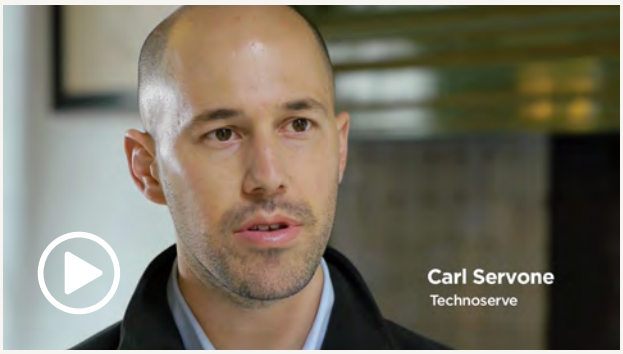
In order to optimize the design and impact of SDMs, better data collection at farm level is needed. Some cases had a structural approach to data collection, as is illustrated in case highlight 2, however the majority of cases do not yet. The primary barrier was cost, surveying farmers is time-consuming and requires a robust M&E system for data management and analysis. However, data is becoming cheaper to obtain, with cost-efficient data collection technology more widely available. The value of data is also increasing, as companies start to realize the need to tailor service packages to different profiles of farmers to increase impact. All participants in the study that did not yet have an M&E system in place are currently setting one up (at the time of publication), which will ultimately allow for better capturing of learnings, and communication of impact. The performance and return on investment of a SDM can be substantially improved. Farmer level data is key for tailoring services to specific "farmer profiles", improving adoption rates.

Case highlight 2: data collection and management

Olam Cameroon uses data at farmer level to gain insight into the impacts of its SDM and to improve its operations. Olam's data system is based on the Farmer Field Book, a data collection and analysis package developed by Agri-Logic and DE Foundation, which collects daily data of approximately 150 farmers. Data collected included: a farm profile, a log book on farm activities (labour and inputs), farm yields and an overview of costs and revenues of the farmer.

At the end of the season, the farmer receives an overview of their agronomic performance and economic profit and loss statement, so they can track performance and compare it to that of their peers. The collected data is used by Olam to track the impact of the service packages and the degree of adoption of practices, in order to improve service delivery. Olam is able to conduct an analysis on the impact that specific farm activities and investments have on a farmers' productivity and profitability. Allowing them to assess the effect of the services offered, and adding significant value to the operations and continuous improvement potential of the SDM.

Another example of the importance of data collection and management from Technoserve



Section 2

Impact at farmer level

Impact at farmer level

Key takeaways

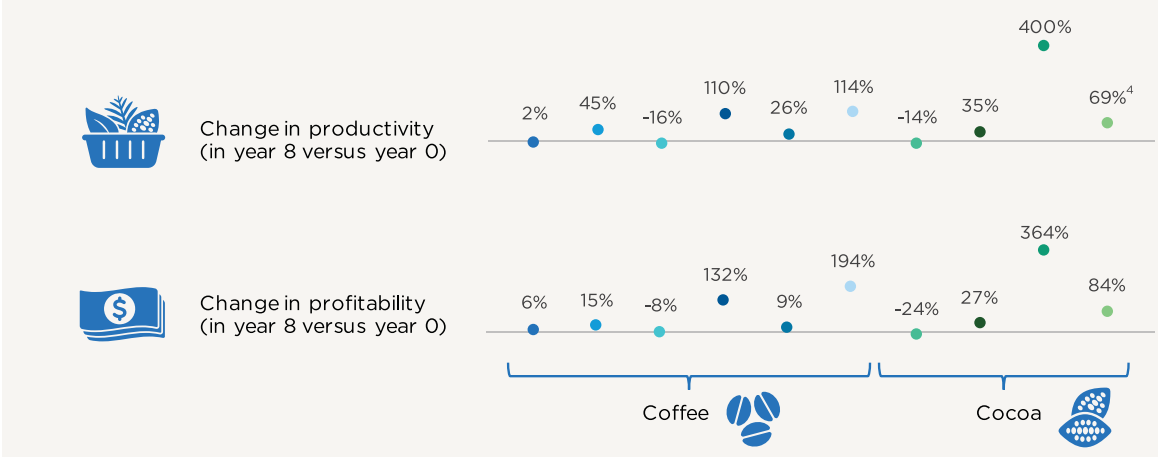
- In the 10 models analyzed there was a large variety in the impact on farmer profitability: from 24% decrease to 364% increase.
- The average profitability increase was 57% over the 8 year period, which was a good result but will not be sufficient in some countries to keep smallholders producing cocoa and coffee.
- The average value created for each dollar invested was $5.1, showing that (private) SDMs offer an effective channel for improving farm value.
- Without rejuvenation of aging trees, there will be no long term positive impact for farmers.

2.1 Farmer profitability

All models analysed aim to improve farmer income, primarily by improving yields and/or quality of the farm produce. To assess the achievements of the ten cases in a comparative manner, we have calculated the impact on farmer productivity and profitability over a period of eight years[2] (see Figure 1). The variation in profitability for the farmer was significant, ranging from a 24% decrease to a 364% increase against the starting point, with a trimmed average[3] of 57% increase. This is relatively the same story when looking at farmer productivity, with a huge variations across the SDMs.

When unpacking this, we noted that the yield levels at the start of the service influence the increase in percentage of productivity, if yields were high at the start, the increase over time was modest. This was particularly notable in one model, which had high starting yields and relatively low impact on both productivity and profitability.

Figure 1: Change in productivity and profitability across SDMs



2. The models all have different starting points and periods of operation. In case the models have not been running for 8 years or longer, projections have been used to calculate the impact of the models.

3. The highest and lowest values have not been used in calculating the trimmed mean.

4. Change in productivity and profitability for this case has been calculated over a period of five years (instead of eight ears), as it was not possible to extrapolate based on the existing data.

We also saw that rejuvenation of the farmer tree stock had a strong impact on the outcomes of a SDM. The case with a 132% increase in farmer profitability (partly based on real data) was largely driven by rejuvenation; (for details on this case see case highlight 5 on page 12). The case that showed a 400% increase in farmer productivity, albeit based on projections, was based on an aggressive rejuvenation strategy (25% of the farm is grafted each year). In two of the models the calculations showed a negative impact, mainly due to the declining yields of aging trees. The services offered by the service provider were insufficient to compensate for the loss of productivity over time. As a result of this insight, one of these companies has decided to integrate rejuvenation services in to its SDM operations, to meet its corporate objective of doubling farmer income.

Equally insightful, a case was able to achieve a 194% increase in farmer profitability (largely based on historical data) due to a long-term investment in farmer organizations (see case highlight 3 for more information). The farmer organizations supported in this model, offer hulled services and as such were able to add additional value. The farmer organizations also sold coffee directly to exporters, and provide inputs on credit, thereby make a margin that financed their operations and as such, become self-sustainable. Another example of the impact of value adding services on farmer profitability is presented in case highlight 4, which achieved a profitability increase of 84%.

Case highlight 3: HRNS - setting up farmer organizations

Working through farmer organizations can be an effective and sustainable way of delivering services to farmers thereby reducing their dependency on external organizations. However, when farmer organizations don't exist, their development is a lengthy process. The HRNS model in Uganda has gone through the process of setting up farmer organizations and building their capacity to become service providers on their own. The first farmer organizations were set up eight years ago, and recently became (financially) self-sustainable. An important lesson from this process is that it was done in a participatory manner: farmers were involved in every step, which ensured ownership of the organizations. Because the coops were in touch with the needs of the farmers, service delivery evolved from purely extension, focusing on increasing productivity, to value addition and market access. When farmer organizations are not able to offer the required services themselves, HRNS continues to support them to establish linkages with third parties such as financial institutions for financial services.

Another example of the importance of farmer organizations from Cargill.

Case highlight 4: PACTS - value creation through quality improvements

The PACTS model in Côte d'Ivoire was focused on improving farmer profitability by increasing productivity, as well as increasing the value of the cocoa produced. The value add was created by offering fermentation and drying services to farmers. Cooperatives bulked the cocoa and transported it to PACTS centres, where the value add services occured, after which the cocoa was returned to the cooperatives and sold by them to Cémoi. The added value of these services can be seen in Figure 1, (the PACTS models shows a profitability increase of (84%), higher than the productivity increase of (69%).

Finally, we learned that the average positive profitability improvement for the farmers, around 57%, was insufficient to significantly improve the household income, therefore we conclude that lifting smallholder farmers out of poverty will not only require innovations to make SDMs more effective, but most likely also moving beyond cash crop focused production towards a diversified farm.

2.2 Value creation

Through the analysis the variation in value was significant, with an average $5.1 of value created for each dollar invested in the models[5]. This average figure shows that it is worthwhile investing in SDMs to create value at farmer level as investments average the profitability increase (57%) calculated in the previous section. Using these averages, we estimate that if a service provider invests $10 in a farmer that has a starting income of $100, the farmer will be able to reach an income of $157 in year eight (57% profitability increase), or a value creation of $5.7.

Figure 2: Value creation across SDMs

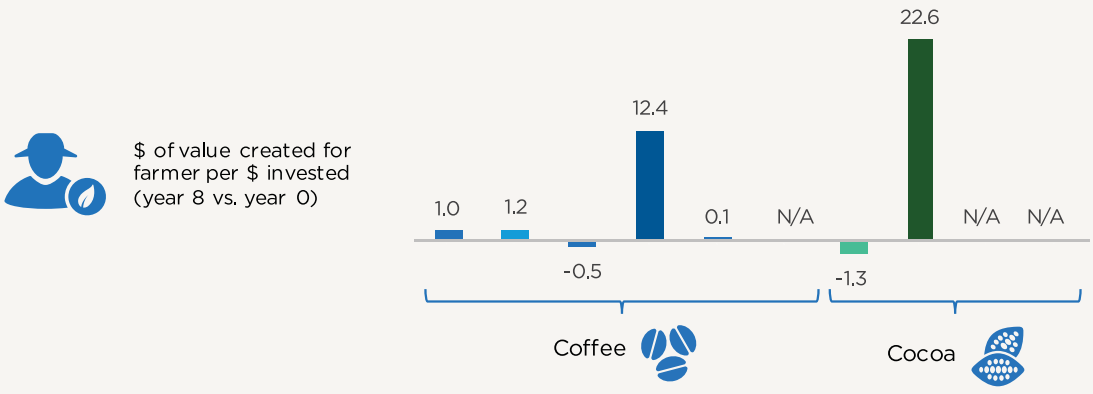


Figure 2 shows the value that is created at farm level for every dollar invested in the total model, again calculated for year 8 compared to the starting point of the farmer (year 0). For some cases it has not been possible to make this calculation, and therefore show as N/A in the graph.

5. Three of the four lowest numbers on value creation are based on real data, while most of the higher figures are based on projections.

As can be seen in figure 2, the average value created was strongly influenced by two cases that had a high value creation. While for one of these cases the value was calculated using projections, the other used historical data. The case based on projections was investing in strengthening farmer organizations which made service delivery look cost effective, however, the costs of the farmer organizations are not included in the total investments. The other case that appeared to have a high return on investment, were based on historical data and again caused by an effective rejuvenation strategy (explained in greater detail in the next section).

Three cases showed a value creation below $1, meaning that the value created was lower than the amount invested in the models. In two cases this was caused by declining yields of aging trees, while in an other the high costs and limited impact of fertilizer resulted in a low value creation.

2.3 Rejuvenation

One of our clearest findings was the need for farm rejuvenation. Almost all cases resulted in an increase in profitability for the farmer on the short term, however, the long term benefits of the services were doubtful. Increase in profitability was positive in the start, but in later years the benefits felt by the farmer were limited, due to the declining productivity of aging trees[6], pests and diseases[7]. This is supported by an earlier study commissioned by IDH, which calculated that for cocoa and coffee around 5.3 and 3.1 million hectares (respectively) of smallholder farms worldwide could benefit from rejuvenation.

Figure 3 shows a fictitious example[8] of farmer profitability to illustrate the dilemma that service operators are facing. Scenario 1 is a baseline farmer not participating in an SDM, with steadily declining productivity over time. Scenario 2 is a farmer participating in an SDM without rejuvenation, which provides improved productivity vis-à-vis the baseline farmer, but still declining yields over time. Scenario 3 is a farmer participating in an SDM with rejuvenation, which causes an initial drop in productivity that later creates a sharp yield increase.

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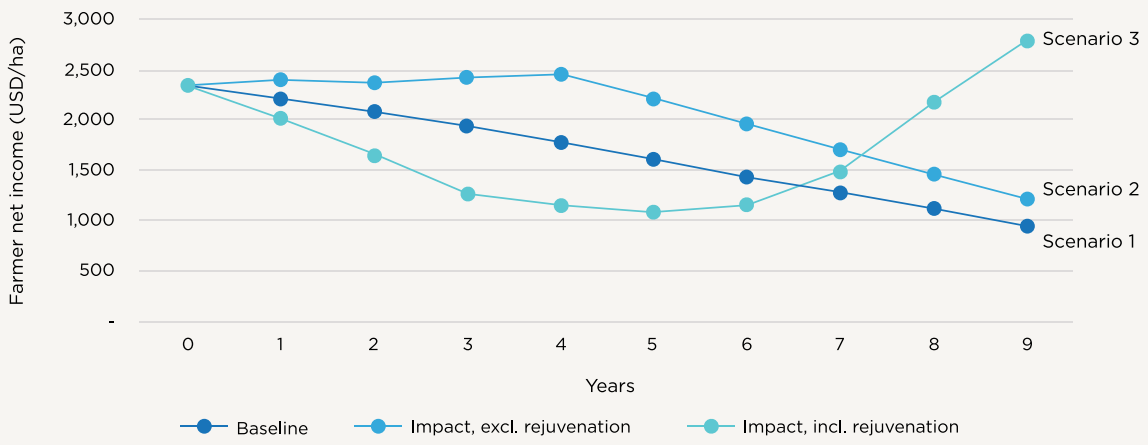
6. This assumption is based on consultation with the case owners as well as on the following sources: Ryan et al. 2009, Damage and yield change in cocoa crops due to harvesting of timber shade trees in Talamanca, Costa Rica; Obiri et al. 2007, Financial analysis of shaded cocoa in Ghana; Gockowski et al. 2011, Increasing income of Ghanaian cocoa farmers: Is introduction of fine flavour cocoa a viable alternative; Thang et al. 2008, Optimal replanting and cutting rule for coffee farmers in Vietnam; Ruf 2007, Current cocoa production and opportunities for re-investment in the rural sector, Côte d'Ivoire, Ghana and Indonesia.

7. IDH & Dalberg 2015, Smallholder tree crop renovation and rehabilitation (R&R): A Review of the State of the Emerging R&R Market and Opportunities to Scale Investment.

8. The assumptions underlying these calculations are: 1) a cocoa farm of 3 hectares with an average tree age of 22 year, 2) a steadily declining yield curve (as trees are past their productive peak), 3) the impact excl. rejuvenation is based on a model in which the farmer applies good practices and inputs leading to a productivity benefit, 4) the impact incl. rejuvenation is based on a model in which the farmer receives the same package as above, but combined with a15% rejuvenation rate (using replanting).

Figure 3: Impact of SDM with and without rejuvenation



Although most of the cases analyzed in this study have some activities related to rejuvenation, there were only three models that had a rejuvenation approach with a positive impact at farm level. It should be noted however, that two of these cases were based on projections, as services are in an early stage of implementation. Nevertheless, there are existing practices from which we can learn (see case highlights 5 and 6). Information on how rejuvenation is funded in the models can be found in section 3.3.

Case highlight 5: Technoserve - effective rejuvenation in coffee

TechnoServe's case showed very high productivity and profitability increases for farmers, largely caused by farm rejuvenation. A key factor was the relatively low baseline productivity and income of the farmers, which can easily make a high percentage increase. Additionally, the farmers in this model used low-cost farming practices: no inputs (e.g. fertilizer) were used, and not much additional labour was needed. This made it attractive for farmers, without the need for large investments. A final success factor was that farmers used stumping as a rejuvenation method, allowing trees to regain productivity relatively soon (after 2-3 year) without having to pay for planting material. During the low productivity years, farmers intercropped with annual crops (beans and chillies) to generate additional farm income. The combination of these factors resulted in farmers being able to reach high productivity increases relatively soon, without much additional costs.

Case highlight 6: Cargill Cote d'Ivoire - combining cocoa rejuvenation with other services

While rejuvenation is an essential activity to keep farm productivity high, it should not be seen in isolation from other services. Sequencing services is important, as Cargill's model in Côte d'Ivoire showed, farmers received a full package of interventions, but in a logical sequence: starting with training, then crop protection, planting material and lastly fertilizer provision. This means farmers received the service when they were ready for it. Using fertilizer, for example makes most sense after farmers have been trained, have applied crop protection, and don't have a very old tree stock. Assuming that all services are adequately adopted by farmers, this sequentially assures that each service has the best possible impact.

Section 3

Services

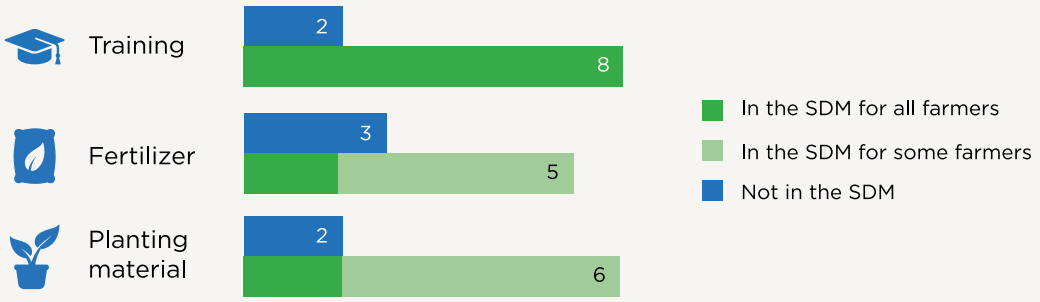
Services

Key takeaways

- Costs of training ranged from $4 to $38 per farmer, with an average of $20 per farmer.
- There was no correlation between costs of training and the impact on a farmer's profitability, the training methodology or the number of farmers per training group.
- The costs of fertilizer was high (on average $160 per farm per year based on the farm use) and it is a risky investment for a farmer, but some companies are able to make a margin on fertilizer provision.
- Rejuvenation approaches vary, but none of the models offered financial services to farmers.

Services offered to farmers included training, input provision (mainly fertilizer) and rejuvenation. In figure 4 we show the extent to which these services were offered across the models. Trainings are traditionally a core part of SDMs, and this was also the case for most of the models analysed in this study. In the two models that did not offer training, farmers still received a form of training, either outside the model by other entities, or through coaching activities. Input provision and planting material were also offered in most cases, although not to all farmers.

Figure 4: Types of services offered across SDMs



3.1 Training

Training is often the first service that farmers receive to prepare them for other services; in some cases farmers are not able to receive other services without going through a training module to ensure the understanding and uptake of the services. The training curriculum generally consists of good agricultural practices, in some cases farmers are also trained in good business practices.

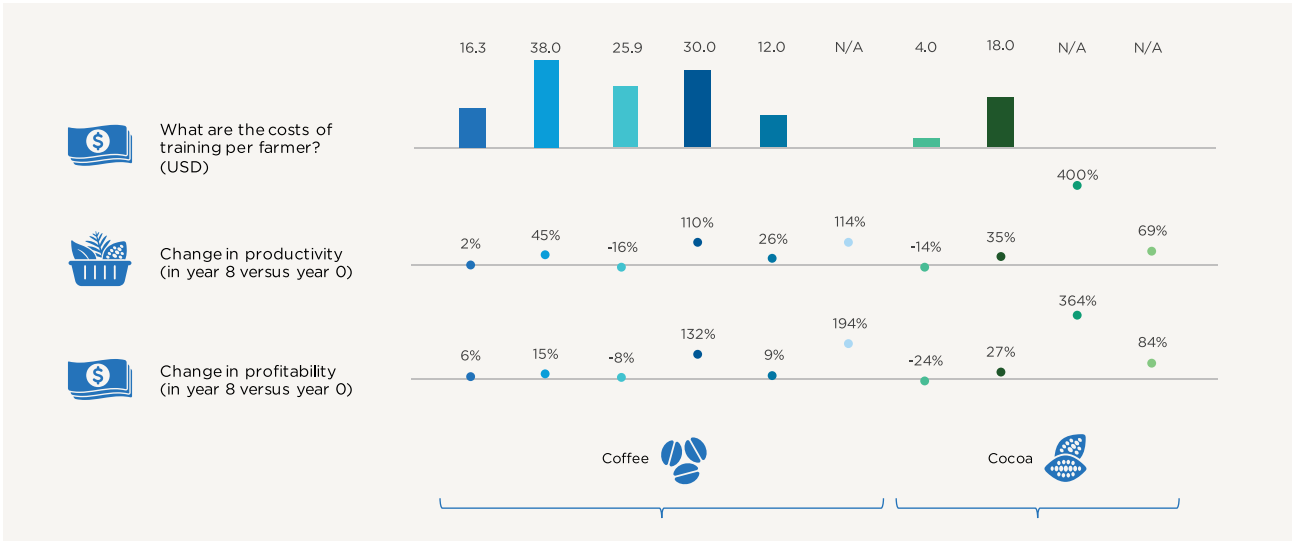
The curriculum used differed greatly per model, most offer a combination of practical field-based training and theoretical classroom-based training. The methods used to deliver trainings also vary considerably: from using existing (public) extension services to training lead farmers and organizing farmer field schools. Some models are moving away from classical training methods to a coaching type of support to farmers i.e. farmers receive year-round coaching and work on a farm development plan with their coach. There was a large variation in the number of modules the farmers was trained with in a specific program (between 10 and 22), and the number of farmers per training group also ranged from 35 to 1.

There were also large variations in the costs of training, ranging from $4 to $38 per farmer, with an average of $20 per farmer, in some cases the real costs may actually have been higher as some of the costs of training staff were included in the overhead costs of the model. Unfortunately, there was no correlation with the cost of the model and the number of training modules the farmer must attend, the number of farmers per training, or the duration of the trainings. The cases that spent the most money per farmer on training did not significantly differ in their approach from the others; they only differed in how these costs were accounted for (in overhead versus direct training costs).

An interesting case example, offered individual farmer coaching from the moment that the farmer starts to make use of the services. The model focused on farm management practices (i.e. pruning) and on the development and monitoring of a farm business plan. Costs of training were low ($4 per farmer), but did not include fixed costs, which are calculated in the overhead costs of the model. This is notable because the SDM operator was accounting their costs.

In Figure 5, the costs of training were set out against the overall impact (productivity and profitability) of the models, but no clear correlation emerged. Assessing the impact of training is difficult, as it is highly dependent on the adoption rates of the good agricultural practices that are offered in the training and there is limited insight into adoption rates, and how to influence them. As training is seen as a precondition for other services, the impact of training cannot be separated from the other services delivered to farmers. Previous research has shown that the main factors influencing impact are the quality of training / the trainer and the amount / duration of training[9].

Figure 5: Training across SDMs: costs per farmer and impact



3.2 Input provision

The access to and proper use of fertilizer, crop protection and other agro-inputs is in many cases essential to increase yields and farm profitability. In 9 out of the 10 cases analyzed, agro-inputs were part of the services offered. These were often provided to the farmers by an agro-input provider directly, but sometimes through another entity (e.g. a cooperative), without the SDM operator as a go between.

9. Kuit et al. 2013, The Sustainable Coffee Conundrum: A study into the effects, cost and benefits of implementation modalities of sustainable coffee production in Vietnam.

The costs involved with agro-inputs – specifically fertilizer – were significant, ranging from $33 to $420 per farm (based on the farm use), with an average of $160, or from another perspective, the costs of fertilizer ranged between 40% and 89% of total costs for the farmer. Figure 6 shows that there are three models that had relatively low fertilizer costs per farm ($33-75) and three models that had high costs per farm ($336-420). These differences can be explained by the fact that some farmers do not apply fertilizer on 100% of their farm, but use it for e.g. 30% of a hectare. In 5 out of 6 cases we analyzed, the service provider advised the farmer on the percentage of the farm that would need fertilizer; for instance, farmers may be advised to apply fertilizer only on the most productive trees. In 1 of these 5 cases, the service provider adjusted its advice on the percentage of the farm to which fertilizer was applied to crop price developments.

From figure 6 we see that the costs of fertilizer did not correlate with farm yields; higher investment in fertilizer did not necessarily mean a higher yield or income for the farmer. In other words, investment in fertilizer is often risky for smallholder farmers because it does not guarantee higher yield. Balancing the investment in fertilizer with a return for the farmer that is both high enough and secure enough, is one of the most prominent challenges faced when constructing a viable service delivery model.

Figure 6: Fertilizer across SDMs: delivery, payment, selection criteria, costs and impact

As fertilizer investments are high, many SDMs include some degree of financial risk sharing. In half of the cases analyzed the companies provided (partial) credit guarantees to input providers which can be called upon when the farmer organizations and / or farmers do not fulfill their obligations. In 4 out of 6 cases, farmer group guarantees were also used, this is when farmer groups (e.g. cooperatives or associations) collectively assume the risk of default for their individual members.

Although fertilizer provision is challenging, there are ways to cost effectively make this part of SDMs. For example, within the cases analysed, one model is planning to make margins on inputs that will partially drive the revenues of the model (see section 4.2 for more information).

An example of making fertilizer provision cost effective.

3.3 Rejuvenation

Another service in many SDMs, is the provision of planting material for farm rejuvenation in combination with recommendations and training on rejuvenation practices.

While 7 out of 10 cases included some form of rejuvenation, only 2 models had a strong focus on it and consider it central to the farm improvement strategy. There was large variation regarding the rejuvenation approach and the proposed rates at which a farm should be rejuvenated. In 2 out of 7 cases grafting and/or stumping was the major rejuvenation approach with rejuvenation rates of up to 25% per annum. In the other cases, replanting was the major approach and there we saw an even larger variance in replanting rates ranging from 3% to 20% per annum. It is generally accepted that grafting and stumping can be done at a higher annual rate, since with these methods trees become productive again in a shorter time period compared to replanting. This therefore reduces the duration period in which farmers are without income.

The costs of rejuvenation and replanting were accounted for in different ways, in 6 out of 7 cases the farmers payed for the costs of the seedlings plus a margin for the nursery. In 1 of the cases, the price of seedlings was subsidized by the service provider. In all cases, the service providers subsidized the start-up costs of the nurseries then outsourced the management, in most cases to farmer groups / farmer organizations or to another third party like a research institute or SME.

Although rejuvenation is critical to long-term farm profitability, the immediate impact on farmer income was negative. Through lowering rejuvenation rates the size of the income gap can be reduced, but it also results in lower yield increase in the long run. Investing in smallholder farm rejuvenation requires long term financing of periods of up to ten years, this gap can not easily be bridged by smallholders with limited financial capacity. At the time of analysis, none of the models offered financial services for rejuvenation, although one was considering setting this up in the future.


NOMBRE DE CABOSSES
NOMBRE DE CABOSSES
MALADIES (POURRITURE)
INSECTS INDISCIBLES ET RAVAGEU

Section 4

Structuring service delivery

Structuring service delivery

Key takeaways

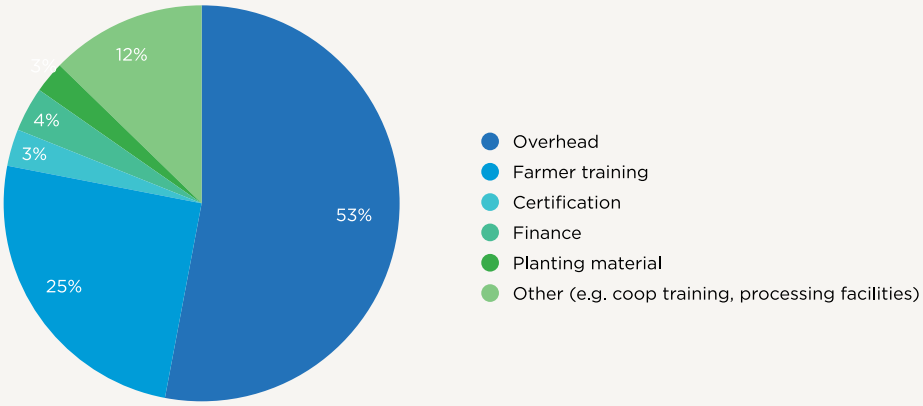
- The main cost driver was overhead, accounting for 53% of costs on average, while training came in second with 25% of total costs.
- As overhead costs were largely fixed, the scaling of models to service more farmers was the key strategy to increase cost-effectiveness.
- 60% of the models had a "programmatic" financing strategy for their service delivery in which the costs were covered by clients, donors and/or the mother company.
- 40% of the cases had an inherent revenue model in which costs were covered from a margin on the services and/or increased sourcing volumes and quality.

4.1 Cost drivers

The main cost driver of the SDMs was the establishment of their "footprint": the overhead on items like the infrastructure of the services and staffing costs. These items accounted for 53% of the total costs on average (see Figure 7), although in some cases this also included service related costs (e.g. salaries and travel costs of trainers. There was a bias in these numbers however, as in some cases service-related costs were included in the overhead, such as the salaries and travel costs of trainers. The overhead category includes the costs of setting up the model, and the costs to keep it running, accounting for over 50% of all costs. In comparison, the actual service delivery (i.e. the other categories in the graph) was less capital intensive.

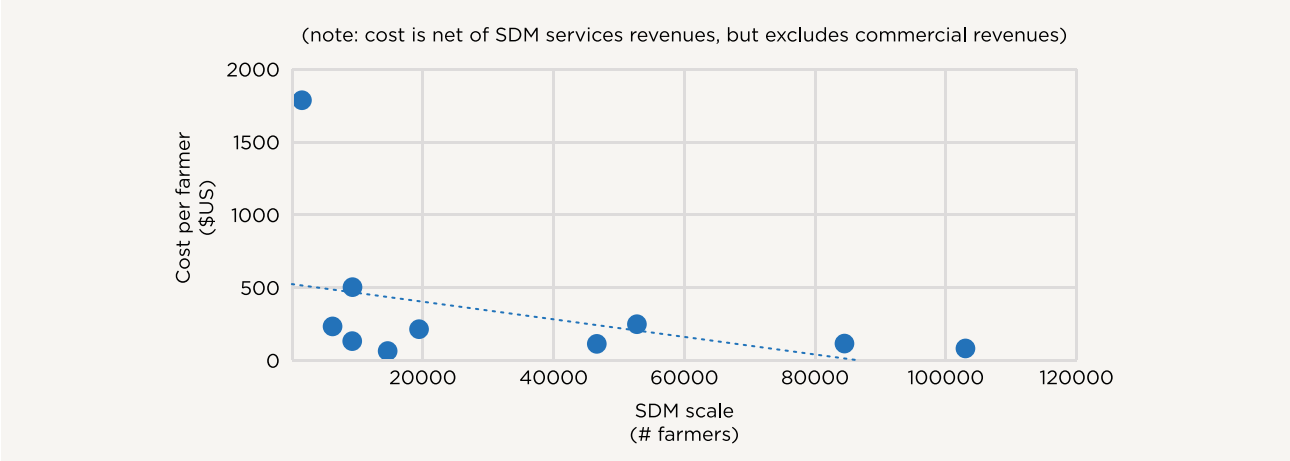
The second major cost driver was training, averaging 25% in ten cases. This again highlights the key role and importance of training in the models. The other major services (input provision, rejuvenation) are not significant in terms of costs, because they were brokered by the service provider rather than financed. For example with fertilizer, in several cases the service provider only facilitated fertilizer provision and did not incur costs, while in other cases the service provider held fertilizer on inventory for a short time and costs are therefore shown as finance costs. The "other" category consists of cost items that did fit into the earlier mentioned activities, such as training of cooperatives (as opposed to farmer training) and the setting up of value adding facilities, such as processing equipment.

Figure 7: Cost drivers for all SDMs (average)



The cost numbers indicated service delivery models clearly also increase efficiency with economies of scale. The model with the lowest number of farmers had the highest costs per farmer, while the two models with the largest number of farmers had relatively low costs per farmer. The scaling of models made them more cost-effective, because the same platform and (fixed) overhead costs were utilized to service larger amounts of farmers.

Figure 8: Cost per farmer versus SDM scale



4.2 Financing service delivery

The financing of SDMs vary from non-commercial to commercial approaches. We have identified that there were fours main models for providing funding. Some were financed mostly or entirely through donor funds, without any stated commercial motive, others were financed by the clients of the service provider (these were commercial in nature (as a client is paying), but did not have an inherent revenue model based on additional sourcing and/or payment for the services by farmers). There were also models financed by the service provider themselves, independent of their sourcing operations. And finally, there were a number of SDMs that sought to recoup their investment, either by charging the farmer a margin on the services, or by sourcing additional volume and/or a higher-quality product.

Figure 9: Source of investment across SDMs

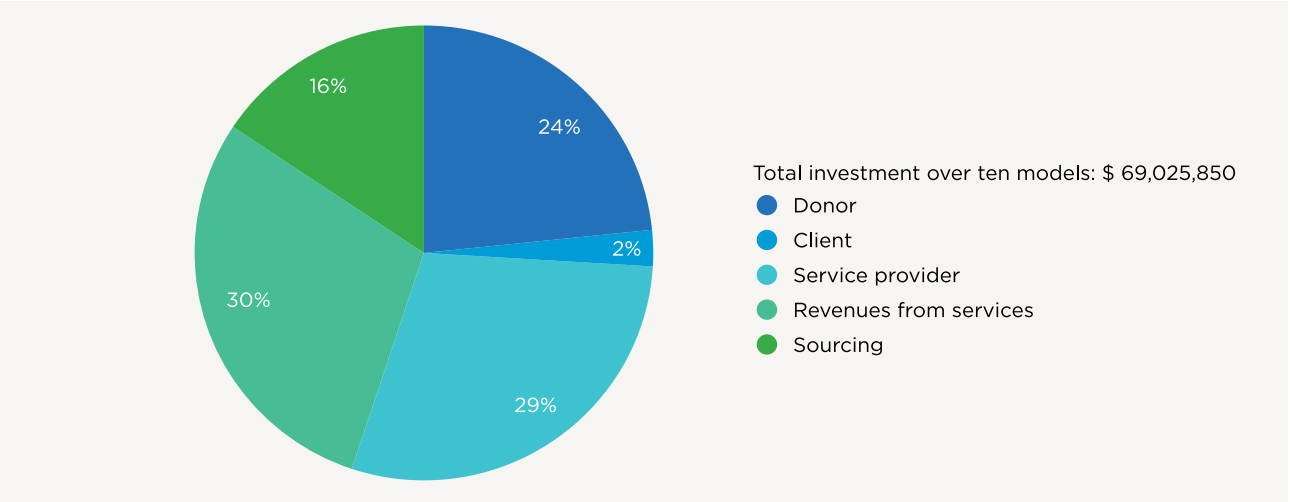


Figure 10: Number of SDMs per financing strategy

Figure 9 shows the accumulative amounts invested by the 10 SDMs, divided by the source of funding. The Figure shows that 55% of the investment was financed by the service provider, clients or donors. In 6 models, this "programmatic" financing strategy was the main way to recoup the costs of service delivery (see Figure 10) i.e. the service provider agreed with either a third-party funder (donor, client) or within its own business to execute services based on the available funding. Such a strategy may offer long-term continuity risks, as the investment does not generate a return and therefore the scale and time horizon of the model are limited to the availability of programmatic financing.

Four models had an inherent revenue model, in which the costs of the services were (partially) recouped through either a margin on the services or higher (quality) sourcing volumes. Of these four models, one was based on real data and was able to recoup more than its investments through additional revenue from sourcing. In this model, fermentation and drying centers were established that support farmers with agronomical training and inputs. Through fermentation and drying, higher quality cocoa was achieved, the service operator was able to receive higher prices and increase their revenue. An additional model is now being engineered to generate revenues at scale, further explained in case highlight 7.

These types of financing strategies may offer more sustainable alternatives for the continuity of service delivery. If investments in an SDM are able to generate a positive return, there is reason for further investment and scaling up, meaning more farmers can be reached in the end.

Case highlight 7: long term self-sustainability

An example of a model working on long term self-sustainability is Barry Callebaut in Côte d'Ivoire. They generate revenue streams through their sourcing activities, as they feel that long term dependence on donor funding for business activities will not result in long term sustainability. To do this, Barry Callebaut is translating the costs of the model (including platform costs) into the revenues that need to be made, for example farmers paying for the services they receive. For this to work, farmers need to be convinced that it is worthwhile for them to pay for the services. Barry Callebaut looks at farmers as clients – not just suppliers – and are aiming to convince them by proving the quality of the services and the benefits it will bring. This is challenging and requires experimentation, but the SDM analysis has helped Barry Callebaut to better understand the impact of their services on farmer profitability.

4.3 Supply chain integration

The SDMs analysed in this study grew organically over time. The models were often initiated as part of a corporate social responsibility strategy, in which social and environmental risks were managed through a controlled supply chain (often including the use of sustainability standards). Innovations and expansions beyond training arose, as the models tried to address the root causes of sustainability risks, such as the massive poverty in smallholder agriculture. The models have grown from there, adapting to local circumstances and needs as they go, showing the flexible nature of the service providers.

This organic development process has meant companies added new activities to their service model without necessarily having a systematic overview of activities. For this reason, it took significant effort in the analysis to clarify the different service operations in a coherent structure. Many SDMs are primarily occupied with handling day-to-day flow of goods and services, without extensive thinking on the design and improvement of the models, and how these could further strengthen (and/or fit into) the core business of the supply chain companies.

Although service models have evolved over time, we do see two predominant structures. Two-third of the models integrated service delivery as much as possible into the supply chain operations of the mother company, linking it to origination/sourcing, client account management and other core business activities (an example of integrating service delivery into the supply chain is presented in case highlight 8). In other cases, service delivery was set up complementary to the existing supply chain; these companies wanted the services to be provided independently from their own activities by a functioning service industry. The institutionalization inside or outside supply chains provides a second dimension, aside from financing strategies, through which we can characterize SDMs.

Case highlight 8: Tembo Tanzania - direct sourcing from farmers

Tembo (Tanzania) started its SDM in 2014, delivering services to and sourcing from farmers through existing farmer groups. In the first year of these operations, Tembo experienced many challenges related to weak farmer groups. For example, too often the farmer groups didn't act in the interest of their members and challenged a transparent and fair flow of services and prices. Due to these challenges, when the village was capable of delivering 20+ tonnes of coffee annually, Tembo adapted its model to work directly with farmers by setting up village buying posts. From these village-buying posts, Tembo field officers organized the farmers in the village, train them and purchase coffee directly. From the second year, the village buying posts could also facilitate agro-input distribution through saving schemes and at a later stage, the field officers were trained to set up and manage nurseries. In this new structure, the problems that were faced in the first year should be resolved, benefitting both Tembo and the farmer.

4.4 Archetypes

In the sections above we identified two variables that tell us something about the way service delivery models are structured. The two variables have been placed in a matrix to create four distinct archetypes of SDMs (see Figure 11, in which the ten cases have been plotted). These archetypes are not the final framework through which we propose all SDMs should be analyzed, but rather a starting place for better understanding how to develop the various models and when they can best be used for which purpose.

The archetypes help to make sense of the large variety of service delivery models in agricultural supply chains. As the models analyzed have all grown, based on trial and error, we found it useful to have common language on the different types of models implemented.

These four archetypes are summarized below:

1. **Client supply innovation** are models in which the service provider sets up a supply chain development program based on the needs and (co-) funding of specific clients (in some cases clients demand for certified / verified / traceable produce). Often the farm produce is processed and sold specifically to the client, and the client is enabled to develop specific consumer communication based on the program.

2. **Commercial service supply** models in which the service provider is developing service delivery as an integrated element of its commercial supply chain strategy, including service supply on a commercial basis.

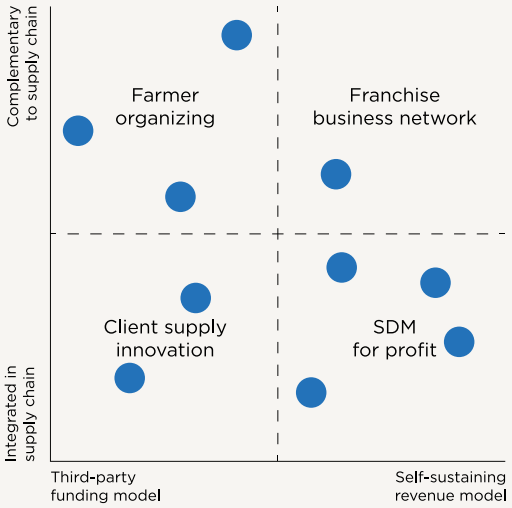
3. **Farmer organizing** models in which the service provider sets up grassroots structures for farmers (associations, cooperatives) for the provision of services. The setting up of these structures is regarded as an upfront investment, financed with third-party funds, after which the structure should be self-sustaining.

4. **Franchise business network** models in which the service provider sets up professional service entities outside of the current supply chain, which offer their services to farmers on a commercial basis. These entities can be characterized as franchise entrepreneurs that develop and invest in their client base, with support and guidance from the supply chain company. An example of this is presented in case highlight 9.

Case highlight 9: Mars - service delivery through farmer entrepreneurs

Mars runs the Cocoa Academy, a franchise business network, in which selected farmers are trained as Cocoa Doctors to run a Cocoa Village Centre (CVC). CVCs are economically independent enterprises close to the village, where a 'Cocoa Doctor' has a demonstration farm to display rejuvenation and farm management practices, and supplies farmers in the surrounding area with planting material and inputs (e.g. fertilizer, crop protection) as well as a grafting service to improve their own farm productivity. These Cocoa Doctors are actually independent service providers, supported by Mars. One of the operational challenges for Mars in this model is selecting the right farmer that is suitable to become a Cocoa Doctors. At the start of the program, Mars mainly selected farmers based on their agronomic qualities, but found that not all of them have the entrepreneurial mind-set needed to become a Cocoa Doctor. As such, the selection has shifted to become more focused on entrepreneurial qualities (e.g. salesmanship).

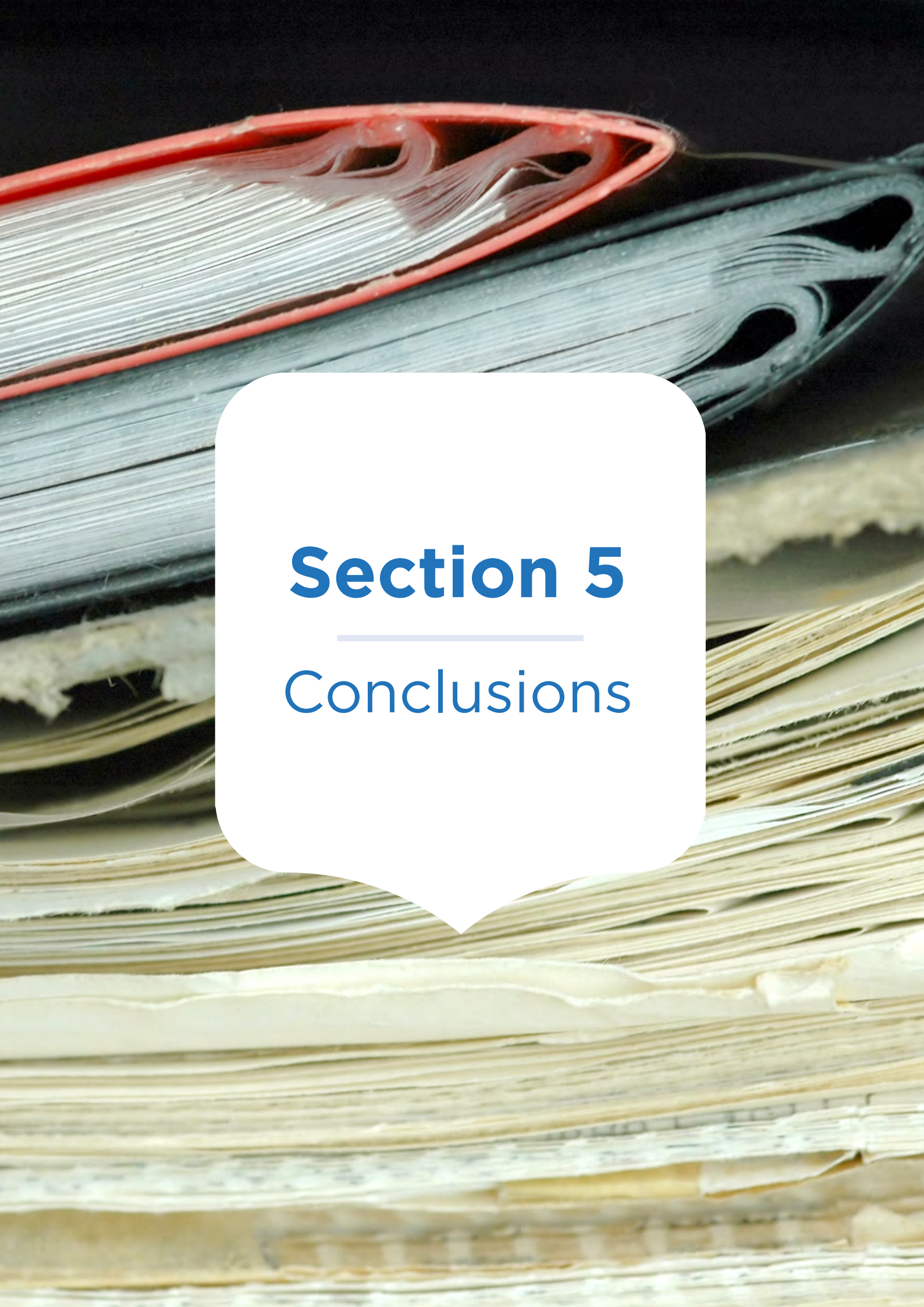
Figure 11: SDM archetypes



All four archetypes have strengths and potential pitfalls. For example, the franchise business network and SDM profit models can relatively quickly break-even, because there is a revenue model underlying the model. The farmer organizing model is likely to require more initial investments, but when it is successful, it can create significant benefits at farmer level, which appears in the numbers we presented earlier (figure 1 and 2). The client supply innovation model can be set up relatively quickly if the needs of the client are clear, as existing supply chain infrastructure can be leveraged for service delivery, however, this model can have continuity risks as client needs change over time.

We also see that SDMs sometimes transform into hybrid archetypes. For example, client supply innovation models are moving towards the off-taker driven services model, when they not only provide agricultural services but also more financial services. There are also cases that move from an off-taker driven services model to a franchise business network, when part of the services are offered by independent agri-entrepreneurs.

Although the current study has given insights into the different characteristics of SDMs, further analysis is needed to better understand how service delivery can be optimized for each archetype. Through our continuous work with SDMs, we will further investigate whether other variables like the type of service supplier, the level of engagement of the service operator touch (i.e. only training) or heavy touch (serving the full farmer household) and the level of formality play a role in defining archetypes.



Section 5

Conclusions

Conclusions

5.1 Driving SDM performance

Through these analyses, we have identified two main recommendations for which performance in SDMs can be improved. By focusing on the whole farming system, and clever design of blended finance solutions that shift over time in line with the maturity stage of the SDM. This section will present some reflections these two avenues.

5.1.1 Impact on farm economics

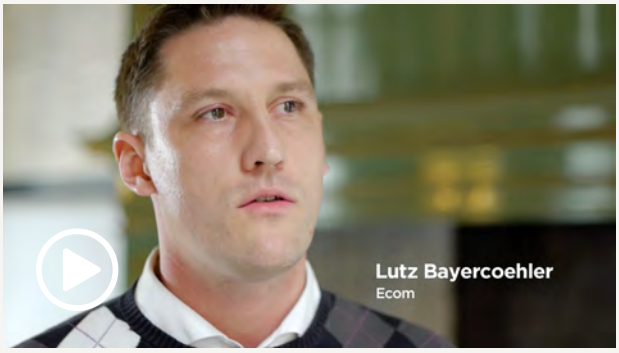
In many coffee and cocoa producing countries, smallholders tend a diversified farming system with both cash crops and food crops present on their farm. In addition to farming, they often also derive income from off-farm activities. Food crops play an important role in both the nutrition needs of a household, as well as generating additional cash flow during the lean season. Service providers need to take this entire farm system into account, focusing on farm profitability (rather than productivity) and farmer resilience.

For many years there has been emphasis on increasing farm productivity without considering the additional investments (both in cash and in labour) needed to achieve higher productivity. Often the costs of the additional investments did not exceed the benefit of increased productivity for farmers, meaning they did not truly benefit from shifting from low input – low output systems to high input – high output systems. Understanding the farm economics as a whole, including all revenue-generating activities and costs, can enable service providers to make more impactful investments.

Some of our partners are in an early stage of piloting innovations, or are exploring solutions, to work on food crops and multiple cash crops beyond the commodity of their immediate interest or to expand their service supply (see case highlight 10 for an example). Models that are willing to go 'beyond the main cash crop' and take the complete farm economics into account are expected to prove as a leveraging opportunity.

As there is a shift in thinking about the dynamics of a farm, there is also a shift in thinking on the services that can be supplied to farmers. And with this, farmers are more and more seen as customers of services, rather than merely suppliers and beneficiaries of service providers. To serve farmers even better, there is a need to gain insights in both farmers needs for specific services and how decisions are being taken with regard to farm and off-farm investments. Once further data is gathered, farmer profiles (including their off-farm activities) can be developed to paint a more complete picture.

Case highlight 10: Ecom Tanzania - farmer income diversification



With perennial crops, farmers need to diversify their income to make sure that their cash flow is ensured year-round. Ecom Tanzania is piloting a project on diversification with about 700 farmers, offering support on sesame cultivation. Looking into the needs of farmers in specific geographical areas, this project aims to increase farm income. Sesame is an annual crop and provides the farmer with an income during a period in which the income generated from coffee is low. In the first year of this pilot, Ecom Tanzania has sold ca. 500 tonnes of sesame to a local buyer; for the second year they are aiming to double the volume, as well as to export the produce themselves. The additional income gained by farmers is on average $300 per acre per season. The sesame income is used by farmers to address immediate short term needs (food, school fees), as well as to finance coffee inputs and labour for coffee harvesting. This also helps to create a stronger position for the farmer in relation to brokers that take advantage of inadequate cash flows of farmers in the off-season. Pilots like these can help shape strategies to improve farm household income.

5.1.2 Clever design of blended finance solutions for the variuos maturity stages of SDMs

For profitable service delivery, a cleverly designed blended finance solution is needed, one that is able to shift over time, in line with the maturity stage of the model. As the analysis has shown, the initial investments for setting up the service infrastructure are large – on average more than 50% of total costs. When the SDM is up and running, cost-effectiveness can improve drastically through scaling to provide services to additional farmers. The services become really profitable when the service provider achieves high adoption rates among the farmers, but best practices in driving and measuring adoption rates still remains relatively unknown. In cases where service providers base their revenue on additional income from sourcing, farmer loyalty is a key lever and partners are also exploring how to influence this.

The extent to which the different services in a model can become profitable varies. As such, financing solutions differ between models, as well as over time. Parts of an SDM that are profitable can be eligible for commercial financing, while other parts require blended finance or subsidies to continue the delivery of services. Modeling the timelines of specific services and when they will reach sustainability can help define ‘tipping points’ for different types of finance solutions. In conclusion, while upfront investments in SDM infrastructure may require subsidies, (parts of) SDMs can become self-reliant and therefore financed commercially by driving scale, adoption and loyalty.

5.2 What we don't know yet

This research has identified several topics that need to be better understood in order to improve the performance of SDMs:

- The variables that influence farmers' adoption of best practices, and how this relates to loyalty of farmers to the service provider.
- The costs and benefits of training additional farmers versus efforts to increase adoption rates for the existing group of farmers, in order for companies to optimize their training activities.
- How to better cluster and select farmers for 'input readiness' while limiting costs.
- What works best with each archetype of SDM. Archetypes have different routes to achieve scale, cost-efficiency and a sustained revenue model.

5.3 Looking ahead

While service delivery to smallholder farmers has been taking place for a long time, it is still considered to be an incipient field. Experiences are scattered and there is currently limited data and insufficient evidence on what works and what doesn't. Effective service delivery is certainly possible, however, and it can benefit both businesses and farmers. As such, it is worthwhile to invest in these models, to further improve and bring impact in a sustainable way. This process starts with gaining insights into the current situation and models. This study has provided some of these insights and IDH intends to continue building knowledge and experience on this topic. We invite pioneers to join in this journey, improving business models for effective service delivery to smallholder farmers.

Summary of key takeaways

- Only 3 out of 10 models base their projections 100% on historical data.
- Data collection and management is costly, but all companies are investing in data systems as they increasingly value data to guide SDM strategy and operations.
- In the 10 models analyzed there was a large variety in the impact on farmer profitability: from 24% decrease to 364% increase.
- The average profitability increase was 57% over the 8 year period, which was a good result but will not be sufficient in some countries to keep smallholders producing cocoa and coffee.
- The average value created for each dollar invested was $5.1, showing that (private) SDMs offer an effective channel for improving farm value.
- Without rejuvenation of aging trees, there will be no long term positive impact for farmers.
- Costs of training ranged from $4 to $38 per farmer, with an average of $20 per farmer.
- There was no correlation between costs of training and the impact on a farmer's profitability, the training methodology or the number of farmers per training group.
- The costs of fertilizer was high (on average $160 per farm per year based on the farm use) and it is a risky investment for a farmer, but some companies are able to make a margin on fertilizer provision.
- Rejuvenation approaches vary, but none of the models offered financial services to farmers.
- The main cost driver was overhead, accounting for 53% of costs on average, while training came in second with 25% of total costs.
- As overhead costs were largely fixed, the scaling of models to service more farmers was the key strategy to increase cost-effectiveness.
- 60% of the models had a "programmatic" financing strategy for their service delivery in which the costs were covered by clients, donors and/or the mother company.
- 40% of the cases had an inherent revenue model in which costs were covered from a margin on the services and/or increased sourcing volumes and quality.

Acknowledgements

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