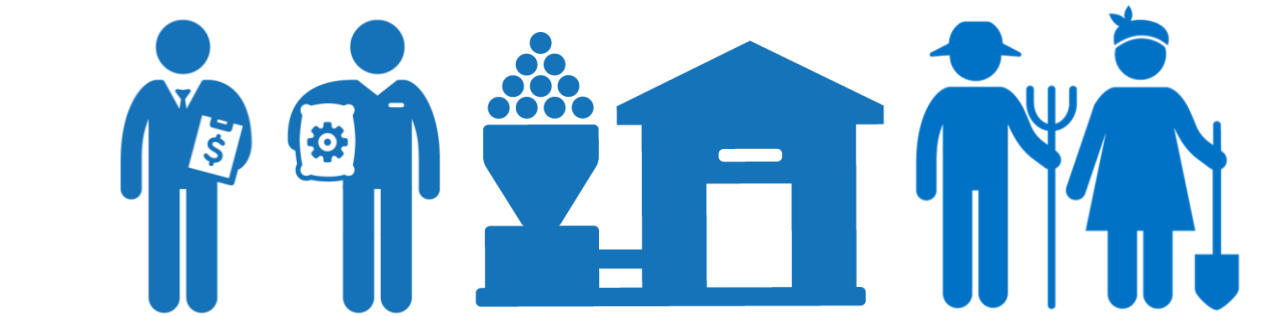
SDM: Case Report Compagnie Fruitière Daboya (CFD)

Service Delivery Model assessment: short version

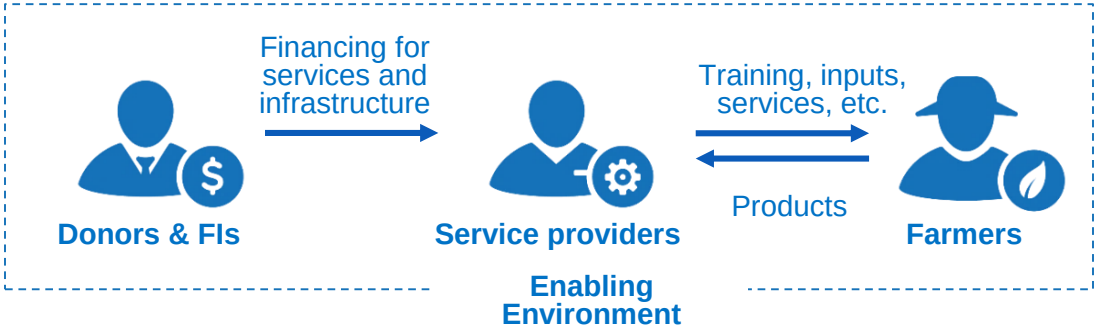
July 2019

Location: Guinea
Commodity: Pineapple
Services: Training, mechanization, irrigation, plastic mulching, planting material, certification



What are SDMs and why are we interested in analyzing them?

Service Delivery Models (SDMs) are supply chain structures, which provide services such as training, access to inputs and finance to farmers, to improve their performance, and ultimately their profitability and livelihoods.



By analyzing SDMs, we aim to support **efficient, cost-effective and economically sustainable SDMs at scale** through:

- Key drivers for success of SDMs benchmarking
- Innovation opportunities to support
- Cross-sector learning, learning community
- Convening at sector and national level

Analyzing SDMs brings a range of benefits

Farmers and farmer organizations

- **Better services** improve productivity, product quality, quality of life and social and environmental outcomes
- **Better outcomes**: improved productivity, income and resilience

SDM operator

- **Understand** your model's business case
- Gain insights to **improve** service delivery
- Develop **cost-effective** SDMs based on insights
- Identify opportunities for **innovation** and **access to finance**
- **Learn** from other public and private SDM operators operating across sectors/geographies
- **Communicate** stories of impact and success at farmer level

Investors/FIs

- **Common language** to make better informed investment decisions
- Insights to achieve optimal **impact, efficiency and sustainability** with investments and partnerships in SDMs

The CFD SDM and objectives

General SDM information:

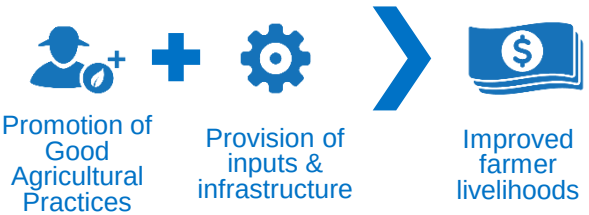
Location:	Guinea
Timing in analysis scope:	2019-2028
Scale (start of analysis):	5 farmers
Scale (end of analysis):	20 farmers
Funding:	CFD, co-funded by IDH
SDM Archetype*:	Local/Regional

- CFD is the Guinean leader in fresh mango export to Europe and North Africa. CFD also produces and exports passion fruits.
- The focus of this SDM study is on CFD's plans to expand their business into pineapples in 2019. They will concentrate on airfreight export of category 1 pineapples to the EU.
- CFD will secure its sourcing via smallholder farmers, providing support to these, while setting up a CFD-owned farm to secure the majority of supply in the long run.

SDM objectives:

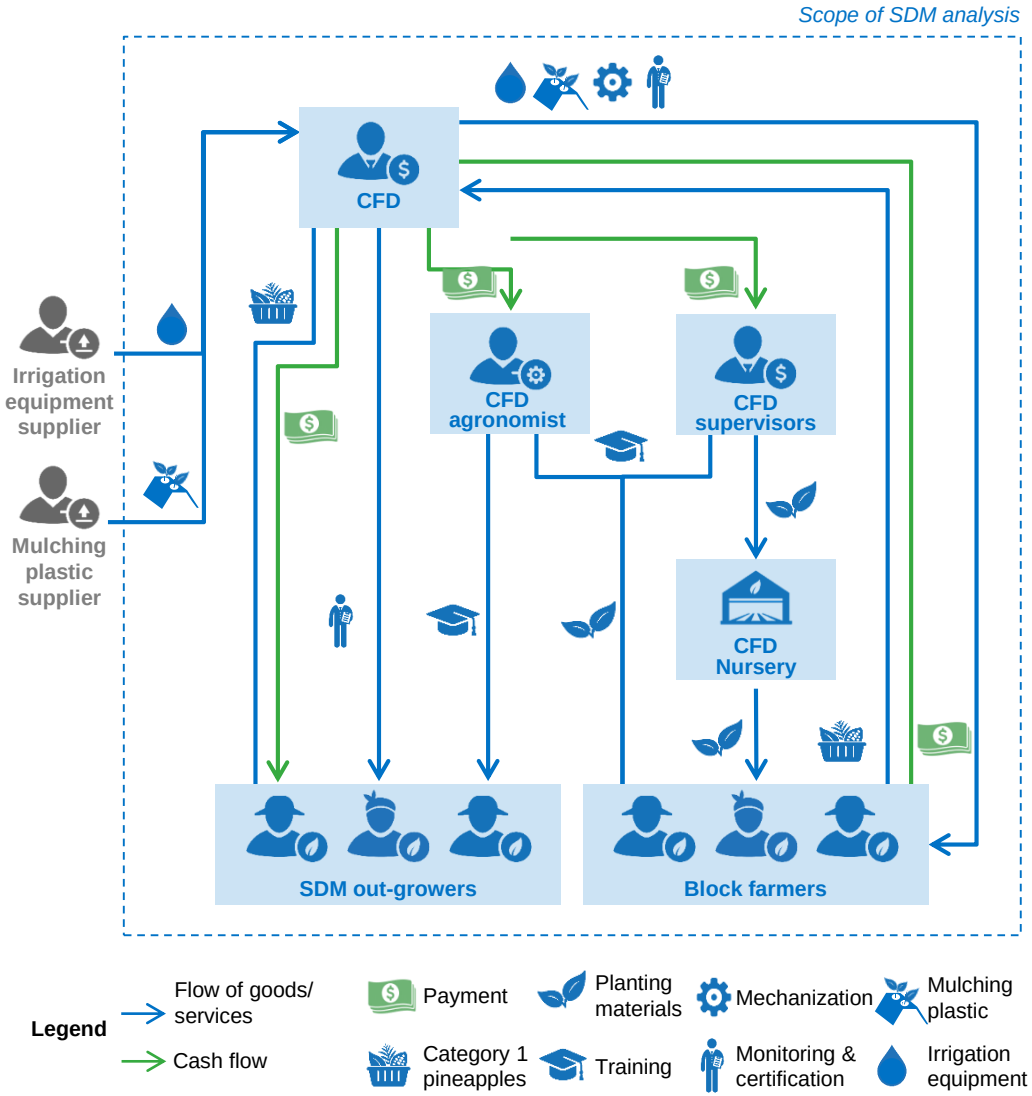
1. Secure a stable supply of pineapples
2. Improve farmer yields and quality of produce
3. Optimize loyalty and service effectiveness

SDM rationale:



* For more info on SDM archetypes, see the IDH Smallholder Engagement Report

SDM and structure and enabling environment



- CFD sources pineapples from three sources: CFD's own commercial farm, CFD-owned block farm, and out-growers cultivating on their own land.
- CFD provides farmers training on Good Agricultural Practices (GAPs), mechanization services, irrigation equipment, plastic mulching, planting material (ratoons), and certification support.

Enabling environment

Farmers are impacted by several factors within their enabling environment. Most important are:

1. Land ownership

Access to land and legalization of land rights is a major obstacle for new investors and farmers looking to expand production areas, impeding investments into the sector.

2. Price and competitiveness

Demand far outweighs supply in the regional markets, pushing the market price up. Senegalese traders pay a market price double that of export companies, beyond profitable prices for export.

3. Inputs and financing

Government-subsidized fertilizers are available at a 70% discount but shortages in supply occur. Most farmers have a cash flow issue given the production cycle of 18 months, and financing is often only done in ten-month cycles, limiting farmers' ability to purchase inputs and irrigation, and hire labor.

Services delivered and farmer segmentation

Farmer training

- CFD will employ agronomists and block farm supervisors, who train and monitor SDM farmers.
- Training will be on GAPs, particularly harvesting and post-harvest handling, and processing.

Mechanization

- Each production cycle, block farmers need ploughing and ridging. These tasks will be done by CFD mechanically.
- To repay the mechanization (among other services), block farmers receive a lower farm-gate price than out-growers.

Irrigation

- CFD will install modern drip irrigation systems on the block farm.
- To repay the irrigation equipment (among other services), block farmers receive a lower farm-gate price for their produce than out-growers.

Planting material

- CFD will set up a large nursery for their own farm. After several years, this nursery will produce surplus ratoons.
- CFD sells ratoons to block farmers and in the open market for 500 GNF/shoot (6 US cents).

Plastic munching

- CFD will give biodegradable plastic to farmers at no cost, that will be use to cover the soils as mulch.
- Production costs decrease significantly as it reduces water evaporation, pests and diseases, and the use of fertilizer.

Monitoring & certification

- CFD supports farmers to comply with GLOBALG.A.P. certification standards.
- CFD also provides Personal Protection Equipment (PPE).
- CFD covers the cost of the GLOBAPG.A.P. certification and the PPE.

Farmers are segmented in this SDM:

This SDM model differentiates between two farmer profiles, based on their land tenure. These segments will allow better service delivery by CFD. The delivery suits each segment's needs and capabilities. The two segments are:

Out-grower

- Farm size: 2.5 ha
- Land tenure: farmer's own land

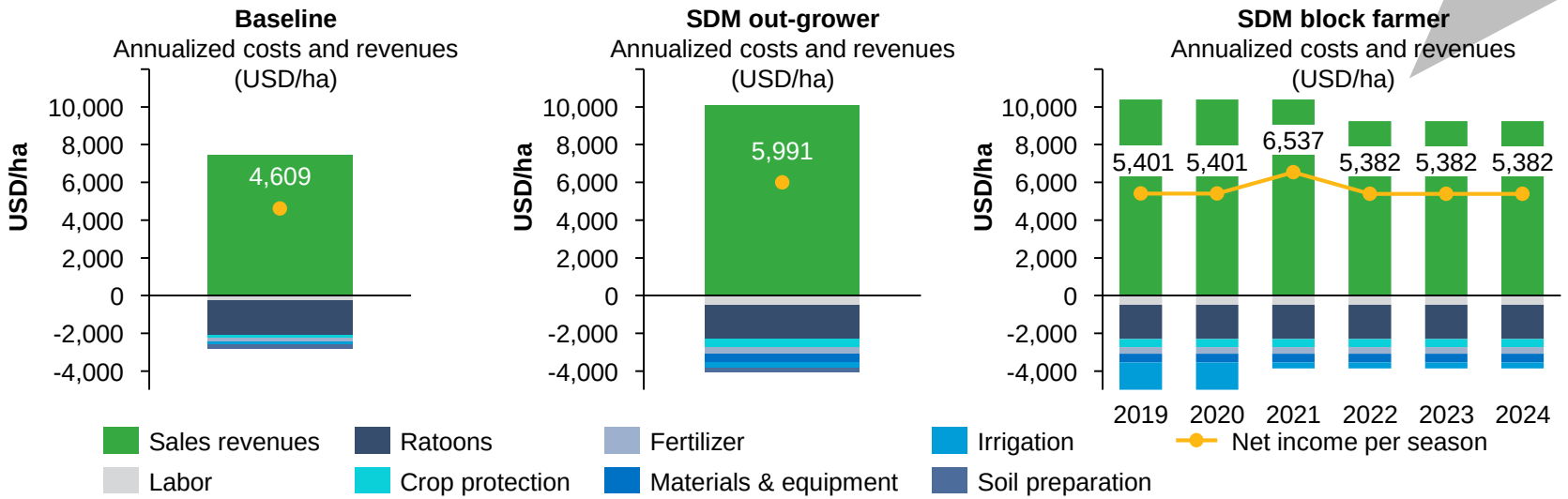
Block farmer

- Farm size: 3.0 ha
- Land tenure: leased land from CFD

Overall SDM impact: Farmer P&L per hectare

A single bar chart is shown for a baseline and out-grower as these have constant annualized revenues and expenses

The average annual net profit is **5,581 USD/ha.** Revenues decrease as farmers repay services through reduced farm-gate price



Economic sustainability at farm level

An average baseline farmer have a low input farm, which leads to relatively low yields and earns him/her 4,600 USD/ha annually from pineapples.

The out-growers are more professional farmers, who already apply GAPs, own a high-quality sprinkler irrigation system, and use plastic mulching. This makes their farm significantly more profitable at 6,000 USD/ha.

A SDM block farmer receives training and close monitoring with CFD installing drip irrigation and plastic mulching, so farmers can realize even higher yields. On average, annual net income of block farmers is around 5,400 USD/ha, well above baseline farmers but below the more experienced out-growers. Variations in the revenue and costs are due to variations in the farm-gate price and costs of equipment.

For all cases, farmer income is sufficient to raise well above the poverty line set at 2,189 USD/year/household[1/].

Main revenue drivers

- **Yield:** Higher yields, mainly due to irrigation and plastic mulching, drive revenues up for out-growers and block farmers.
- **Farm-gate price:** Despite the highest yields, block farmers earn less than out-growers because the farm-gate price is lowered after three years (below the market price) to repay land clearing and annual land preparation.

Main cost drivers

- **Ratoons:** Purchasing new shoots is the largest input cost, because of high prices.
- **Irrigation:** Block farmers who start working on CFD's land need to pay for irrigation equipment upfront, which is a large required cost.
- **Inputs, materials & equipment:** Fertilizer, crop protection, and plastic mulching combined are large additional costs for SDM farmers.

1/ Uses the World Bank's international poverty line of 1.90 USD/day, adjusted for PPP 2016 (private consumption) of 3,527 GNF/USD and the OANDA exchange rate (November 21, 2018) of 9,091 GNF/USD; and assumes a full household of 7.2 persons (the national average).

Specific service impact: sensitivity analyses

Cost and revenues of different irrigation setups

	Basic sprinkler	High-quality sprinkler	Drip irrigation
Cost of system (USD/ha)	850	2,270	6,800
Cumulative net profit year 4 (USD/ha)	1,864	3,490	2,152
Total yield (MT/ha)	45	50	55
Additional yield vs. baseline farmer (38.5)1/ (MT/ha)	6.5	11.5	16.5

Basic sprinkler

The sprinkler system can then repay itself already in the second year. Their obtain the least long-term benefit but is beneficial due to the low investment cost. This system is thus preferable to farmers without CFD or donor support.

High-quality sprinkler

After initial investments are recovered in year 2, profitability is twice as high as the basic sprinkler setup. Compared to drip irrigation, this system is less complex and could be adopted by farmers with a sufficient finance facility to front initial investments.

Drip irrigation

It takes four years to recover investments after which the drip irrigation is the most profitable system from year 5 onwards. Given the large initial investments and complexity of the system, drip irrigation is only advisable for use in a setting with substantial monitoring such as on a block farm.

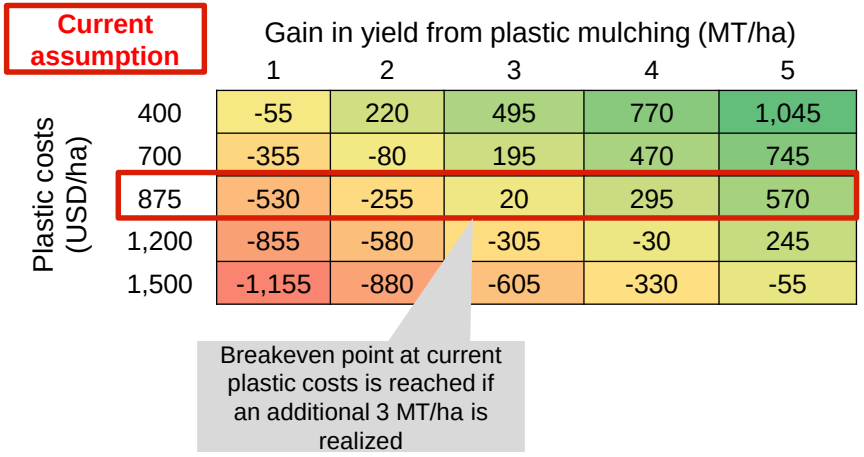
Economic viability of plastic mulching in Guinea

Biodegradable plastic mulching is an innovation with several clear advantages. It reduces the amount of weeding required, keeps the soil moisture content more constant and avoids evaporation leading to less irrigation needed, and reduces the amount of fertilizer needed.

Costs are relatively high in Guinea, estimated at 875 USD/ha compared to 400-600 USD/ha in some other African countries. The plastic can only be used for one cultivation cycle, and therefore all costs need to be recovered in one harvest.

Currently, there is low adoption of plastic mulching, as it is a rather new innovation in Guinea where farming techniques are more rudimentary. Given the few experiences among farmers, further adoption is limited as new farmers are hesitant to invest while being uncertain whether the costs can be recovered.

Under current assumptions, farmers need to realize a yield improvement of 3 MT/ha to break even on their plastic investment. **It is likely that such an increase can indeed be obtained, making plastic mulching in Guinea economically viable**.



SDM P&L, scale and sustainability

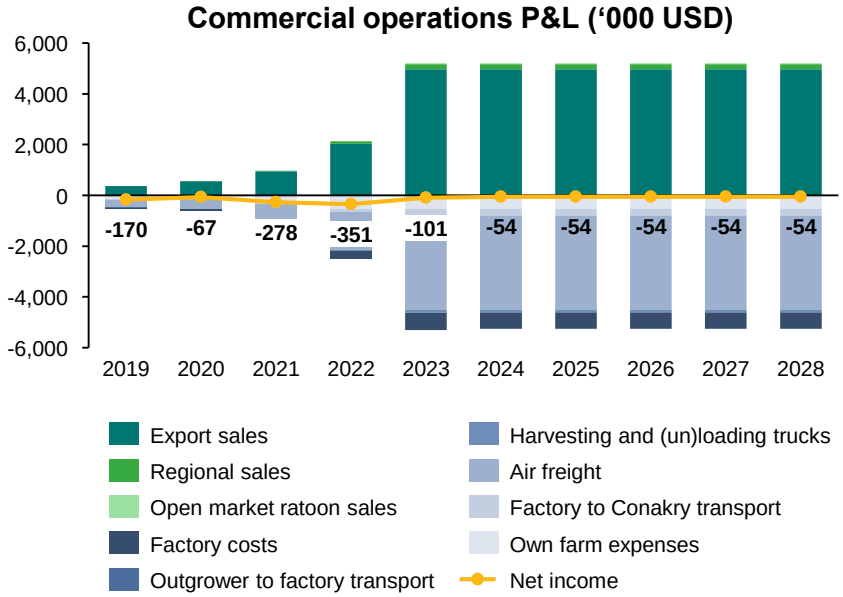
Economic sustainability of the program

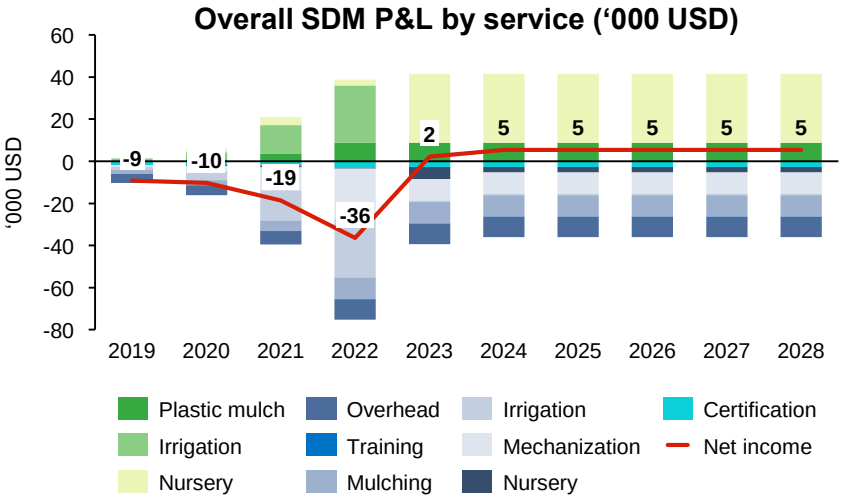
The large change in costs and revenues of the SDM, excluding commercial costs, is due to:

- No more land lease agreements initiated or land clearing needed for the block farm after 2022.
- Before 2023, CFD's nursery is solely used to provide shoots to their own farm. From 2023 onwards, CFD can start selling ratoons.

Over a ten-year period, the SDM has a cumulative loss of 45,000 USD. The loss in the SDM thus needs to be covered through CFD's sourcing operations.

Efficiency of the SDM improves significantly over the ten-year period from a very high net cost per farmer (1,500-3,000 USD/farmer) during initial years, turning into a net profit per farmer of roughly 450 USD. There are little scale improvements, as the number of farmers in the model remains low.





Economic sustainability of commercial operations

The commercial activities of CFD make significant losses in initial years, due to investments needed to purchase and set up their own farmland and processing factory.
After 2002 where operations have been scaled and costs and revenues remain constant, CFD is making an annual loss of 54,000 USD. This is a loss margin of -0.9%, so small cost reductions are sufficient to turn the operations profitable (see page 42).
The largest costs are those incurred by the air freight transportation. Additionally, operation of CFD's own farm and processing costs in the factory are significant.
Under current assumptions, it is not profitable for CFD to export produce. Only locally sold volumes sourced from the block farm make a profit.

SDM outcomes and main learning questions

These are not an official assessment of SDM success or failure by IDH or NewForesight, but an indication based only on the analysis done in this forward-looking study, and on assumptions provided by the case owner(s). Actual assessment of success of the SDM should be conducted during and after the SDM is conducted using measured results

SDM objectives	Projected outcomes
1 **Secure a stable supply of pineapples**	• CFD will export pineapples from three different sources: smallholder out-growers, block farmers, and their own commercial farm. • CFD has more economic stability, due an stable supply of pineapples. CFD mitigated risks of side-selling and non-adopting farmers. • While impact for existing smallholders remains limited.
2 **Improve farmer yields and quality of produce**	• CFD can train and monitor block farmers efficiently and effectively. Combined with the provision of irrigation and mulching plastic, this farmers should increase their yields and quality significantly above that of the average non-SDM farmer. • The selected out-growers are already applying good farming practices and own high-quality sprinkler irrigation, and thus not actively supported with services.
3 **Optimize loyalty and service effectiveness**	• Service provision (such as training, irrigation, and mulching plastic) is designed to break even, but not make a profit. • CFD attracts farmers to the block farm by offering services for free the first few years before recovering costs via a reduced farm-gate price. Over time, CFD needs to evaluate whether similar interventions are required to attract farmers.

Learning question	SDM insights
Which services should be developed (and delivered) to farmers to secure supply?	Farmers require a holistic package of services to reach optimum yields. Mechanized land clearing and annual preparation saves considerable farm labor and may attract more block farmers. Farmers report issues with their cash flow and being able to finance the services. CFD should consider setting up a financing scheme to enable, increase service adoption and attract farmers.
How are farmers organized, and how can farmers make use of formal organization (e.g. assessing inputs at lower cost)?	FEPAF is a federation in which 70% of farmers in Kindia are members. FEPAF wants to be a farmer-led trader and specialized service provider, enabling farmers to market pineapples and access services collectively; thus, lowering cost per farmer.

Key insights

Key drivers of success

- Farmers are seen as clients and CFD only offer services where they can recover their cost via farmer payment.
- The SDM is economically sustainable in the long run without donor funding.
  CFD will rely their commercial operations around three different sources of pineapple. Their sourcing is therefore relatively resilient to common challenges.

Key factors in replication

- CFD has designed their service offering to break even via farmer service payments.
- CFD has a very pragmatic approach to designing the SDM. Starting with a small pilot, the work with smallholders will be scaled quickly if exports are successful.

Key risks

- Currently, the commercial operations of CFD are not profitable, jeopardizing the longevity of the SDM too.
- The SDM is dependent on CFD being able to acquire land in Kindia, which is currently uncertain.
- Price differentials can limit farmer loyalty and adoption rates. The farm-gate price CFD is paying is lower than the open-market price.
- The SDM has limited scalability as it's build around a block farm that cannot easily be expanded.

Opportunities for improvement

- Significant savings can be realized on carton boxes, transport costs to Conakry, and pineapple labeling.
- Integrating the ratoon nursery into the core operations of the SDM can provide a large, consistent revenue stream
- Facilitating financial services to farmers will ease cash flow issues and build a stronger relationship.

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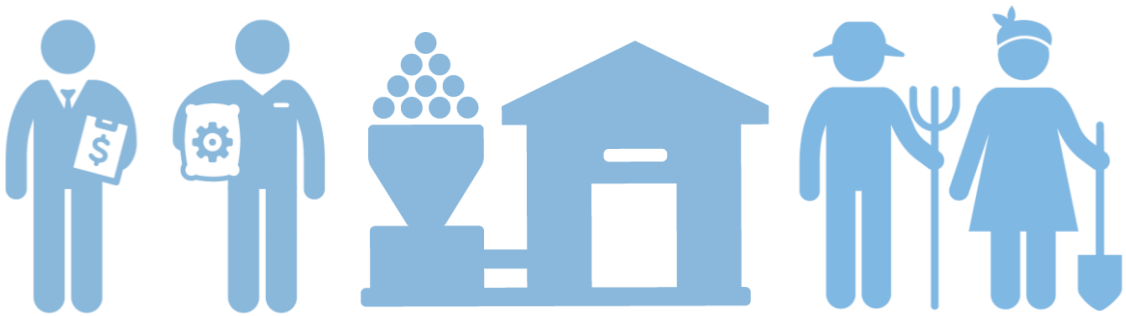

For more information and insights on SDM's, see the IDH Smallholder Engagement Report