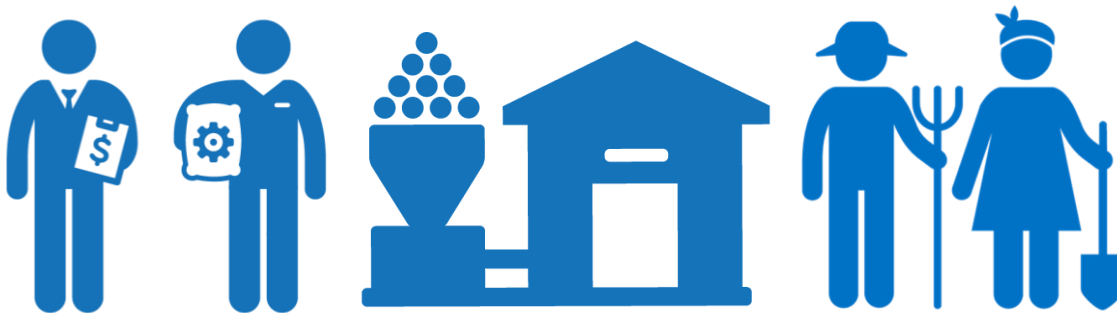


SDM: Case Report Tropicaux

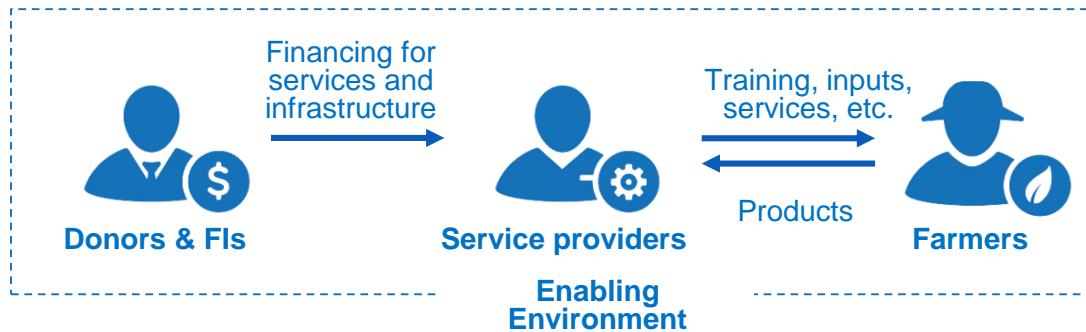
Service Delivery Model assessment: short version
July, 2019

Location: Guinea
Commodity: Pineapple
Services: Training & monitoring, irrigation, mechanization, plastic munching, 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 Tropicaux SDM and objectives

General SDM information:

| | |
|----------------------------|------------------|
| Location: | Guinea |
| Timing in analysis scope: | 2019-2028 |
| Scale (start of analysis): | 33 farmers |
| Scale (end of analysis): | 24 farmers |
| Funding: | Service provider |
| SDM Archetype*: | Local/Regional |

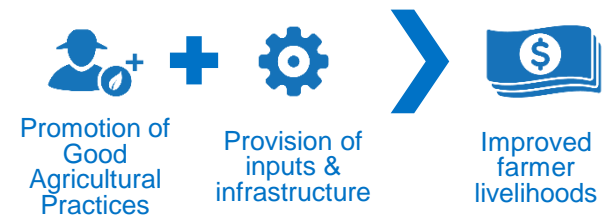
tropicaux

- Tropicaux is a Guinean family-owned company engaged in several ventures in Guinea.
- The company is a result of the family reinvesting its proceeds into agriculture – a multiplier effect – aiming to create more local jobs.
- Tropicaux has a strong emphasis on hiring local staff and training them into leadership positions, and promote the integration of rural farmers and women in business.
- Tropicaux is constructing a semi-automated fruit processing plant to process dried pineapples and mangoes, as well as roasted cashew nuts, aiming to become competitive in the U.S. market.

SDM objectives:

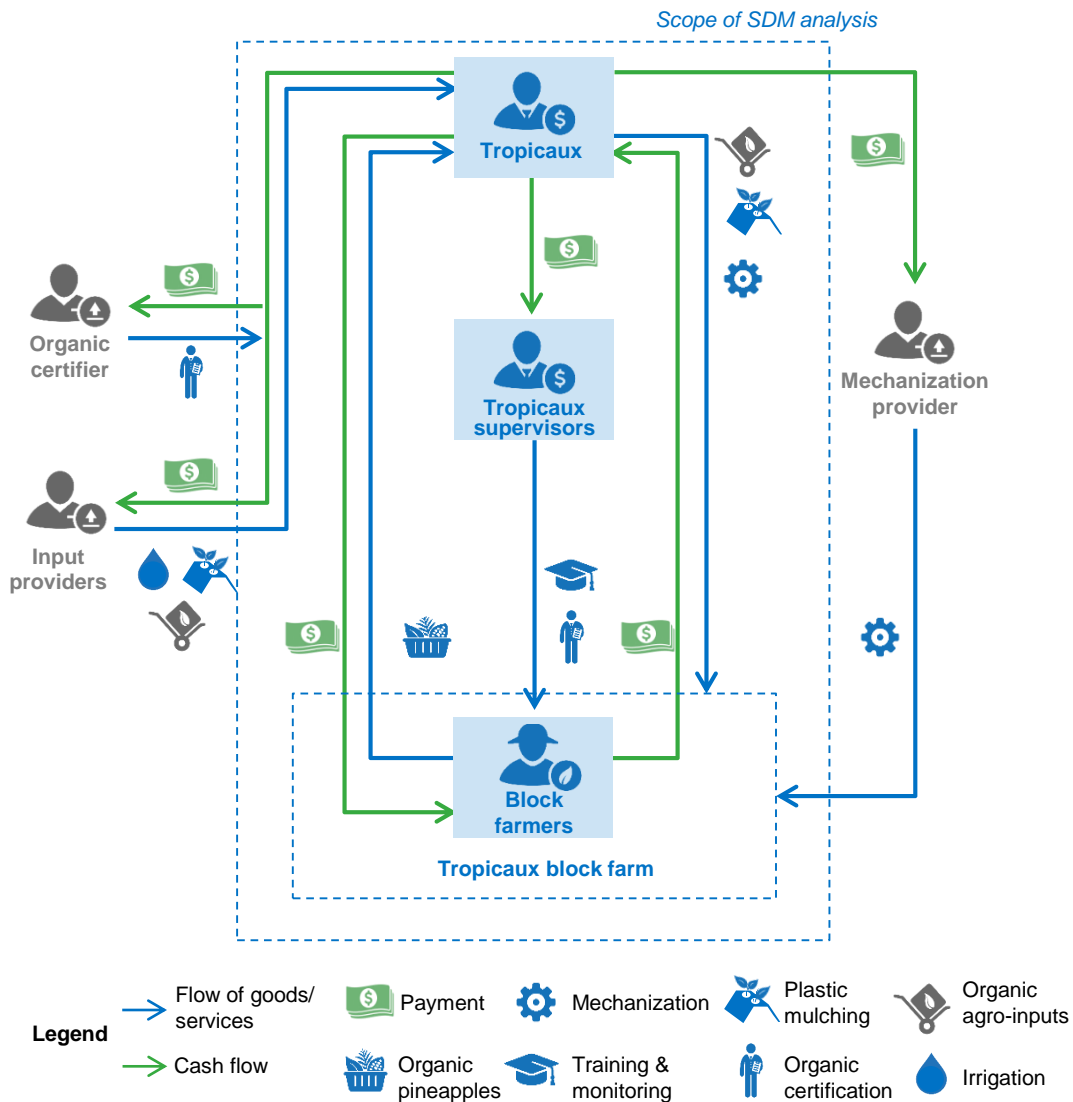
- 1 Secure a stable supply of organic pineapples
- 2 Increase local employment downstream through job creation

SDM rationale:



* For more info on SDM archetypes, see the [IDH Smallholder Engagement Report](#)

SDM and structure and enabling environment



- Tropicaux sources organic pineapples from two sources: Tropicaux-owned block farm, and out-growers cultivating on their own land.
- Tropicaux provides farmers training on Good Agricultural Practices (GAPs), certification, irrigation equipment, mechanization services, plastic for mulching, and agro-organic inputs (outside the scope of analysis).

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

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 irrigations, and hire labor.

Services delivered and farmer segmentation



Farmer training and monitoring

- Farmers are trained on GAPs.
- Additionally, they are educated on producing organically.
- Trainings are provided to individual farmers by Tropicaux.



Organic certification

- Farmers are supported to comply with USDA organic certification standards for Tropicaux to sell the pineapples in the US market.
- Each year, the SDM will be inspected by a USDA-approved auditor.



Irrigation

- The block farm will be installed with irrigation equipment.
- Current projections assume that a high quality sprinkler setup is used.
- To repay the irrigation equipment, block farmers will pay an annual land rent.



Mechanization

- Tropicaux will provide mechanical one-time land clearing.
- Tropicaux will provide mechanization for land preparation (ploughing, ridging).
- To repay these services, block farmers will pay an annual land rent.



Plastic mulching

- Tropicaux will sell biodegradable plastic to farmers at no margin. This will be used to cover the soils as mulch.
- Production costs decrease significantly as it reduces water evaporation, pests and diseases, and the use of fertilizer.



Organic agro-inputs

(Outside scope of analysis on SDM-level)

- Tropicaux needs to purchase organic fertilizers and distribute these to farmers.
- Inputs would be imported from Senegal.
- Potentially, inputs are provided to AVENIRs¹, who can further sell the inputs to farmers in the region.

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 Tropicaux. 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

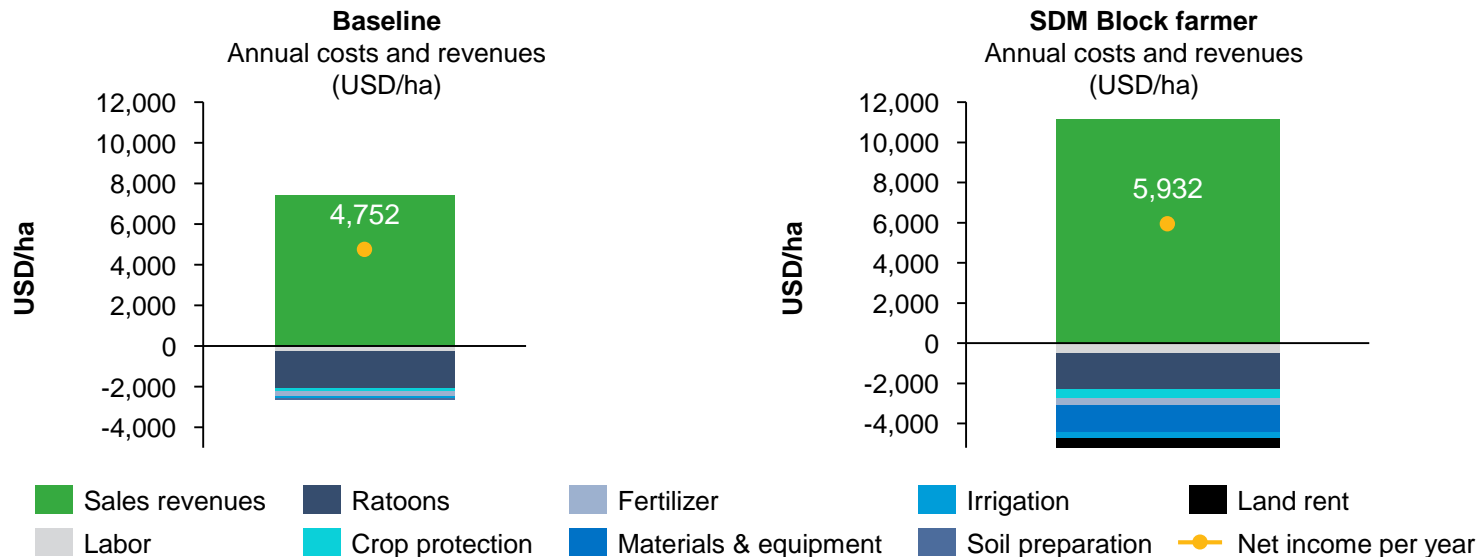
Block farmer

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

1) AVENIRs, "agents of extension, entrepreneurship and rural innovation", are part of a USAID-funded program - in a collaboration between Winrock International and Cultivating New Frontiers in Agriculture (CNFA) - to train young, motivated individuals in entrepreneurial, business and marketing skills in the agricultural sector.

Overall SDM impact: Farmer P&L per hectare

The bar charts show annualized revenues and expenses. See the following page for the monthly cash flow over the 24-month season.



Economic sustainability at farm level

An average baseline farmer have a low input farm, which leads to relatively low yields and earns him/her 4,750 USD/ha annually from pineapples. A block farmer in the Tropicaux SDM receives training, irrigation equipment and plastic mulching, and can therefore realize a higher yield. Moreover, Tropicaux offers a higher farm-gate price due to the organic status. While most input costs increase for SDM farmers, and they need to pay an annual land rent, this is outweighed by the large increase in revenues. Annually, these SDM farmers are projected to earn 5,900 USD/ha, substantially more than baseline farmers.

Farmer income is enough to raise well above the poverty line, set at 304 USD/year/person.

Main revenue drivers

- **Yield:** Higher yields (from 38.5 to 45 MT/ha), mainly due to irrigation and plastic mulching, drive revenues up for block farmers
- **Farm-gate price:** The main driver of the large additional revenues of SDM farmers is the higher farm-gate price they receive from Tropicaux due to the produce being organic.

Main cost drivers

- **Ratoons:** Purchasing new shoots is the largest input cost, because of high prices.
- **Materials & equipment:** SDM farmers purchase plastic for mulching each year, which is their second highest cost.
- **Land rent:** SDM farmers pay land rent over ten years, which provides them with access to irrigation equipment and land clearing and preparation.

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) | 1,349 | 2,627 | 3,944 |
| 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. The basic sprinkler yields the least long-term benefit but is beneficial due to the low investment cost together with complexity of installation and maintenance needed. This system is thus preferable to farmers without Tropicaux or donor support.

High-quality sprinkler

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

Drip irrigation

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

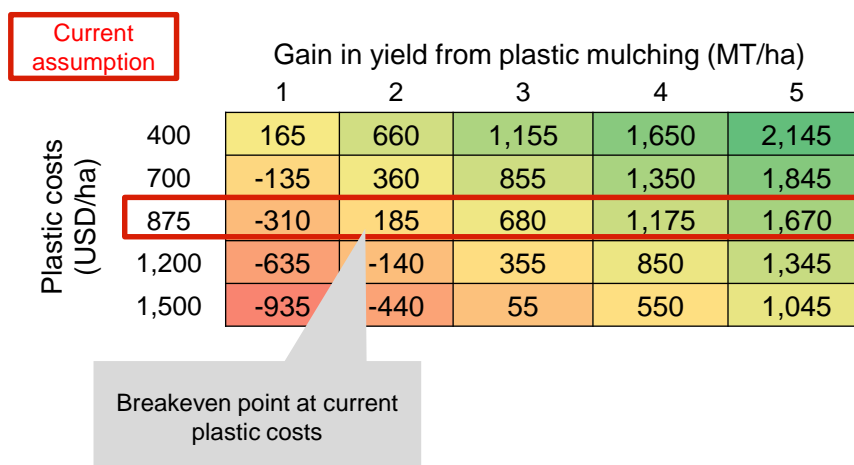
Economic viability of plastic mulching in Guinea

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 2 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 SDM in isolation has a significant **loss during the first four years, before stabilizing in 2023 making small annual losses.**

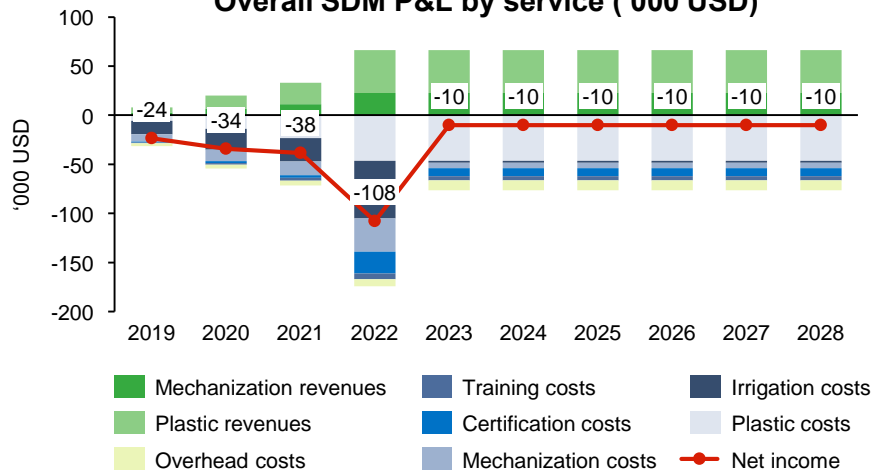
Over a period of ten years, the SDM results in a cumulative net loss of -270,000 USD. However, the SDM enables the commercial operations of Tropicaux as the company would not otherwise be able to access organic produce.

Losses during the initial years are mainly generated by the **high costs of setting up the block farm.** Other costly services are ratoon and plastic provision, but **these are repaid by farmers.**

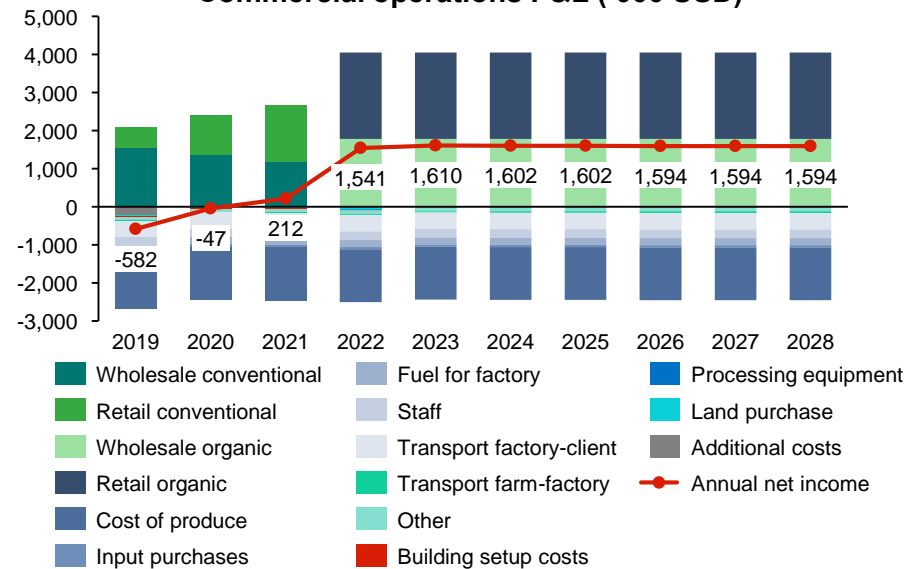
After 2023, the minor net losses remaining are mainly caused by overhead, staff salaries, and certification costs.

The SDM net income per farmer similarly drops in years of high investments in the block farm, USD 1,261 in 2019 to USD 6,919 in 2022. This is amplified by the fact that the SDM target fewer farmers as the block farm is scaled up, the number of farmers goes from 33 to 24, in the period 2019-2028.

Overall SDM P&L by service ('000 USD)



Commercial operations P&L ('000 USD)



Economic sustainability of commercial operations

In 2019, Tropicaux's commercial activities will run at a large loss, due to the high cost for technical assistance to start the model combined with the low price received for wholesale conventional dried pineapples.

In 2020 and 2021, Tropicaux increasingly manages to find a retail market, which offers higher prices.

From 2022 onwards, Tropicaux can switch their processing line to an organic one. This leads to much higher prices received. Compared to the commercial operations, the SDM costs and revenues are minor. Therefore, the SDM can easily be financed by the commercial operations.

However, the profitability of the model is highly dependent on the markets accessed. If Tropicaux is unable to find a market to sell their organic produce for the high prices currently envisioned, Tropicaux's business case becomes much less profitable.

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 |
|---|---|
| <p>1 Secure stable supply of organic pineapples</p> | <ul style="list-style-type: none"> • Farmers can be trained and monitored to comply with organic produce. This is very favorable for prices in the SDM. • The SDM needs to produce organic pineapples for four years before produce can be sold organic. Additionally, it is still uncertain which precise inputs are required to produce organically combined with high yields. And obtaining the right inputs may be challenging and / or costly in Guinea. • By setting up a block farm scheme, Tropicaux ensures a highly predictable amount of pineapples, minimizing risks of side-selling and enabling a high degree of monitoring. |
| <p>2 Increase local employment downstream through job creation</p> | <ul style="list-style-type: none"> • Within the SDM, five block farm trainers are required; and one senior agronomist must be employed to supervise the SDM operations • At its full scale, 17 farmers will work on Tropicaux’s block farm. These may be attracted to farm-gate prices significantly above the open market price. • The SDM also enables the operations of Tropicaux’s processing plant with associated jobs. |

| Learning question | SDM insights |
|---|---|
| <p><i>What is the best service delivery method? I.e. should Tropicaux work with an intermediate service provider and, if so, how?</i></p> | <p>Local AVENIRs could be employees expert on organic pineapple produce. Other services such as provision of irrigation equipment, mulching plastic, and land preparation can well be overseen by one skilled supervisor. If Tropicaux intends to scale up further in the future, logistics of service provision become more challenging. In that case, it could seek collaboration with the local farmer federation FEPAF.</p> |
| <p><i>How does Tropicaux’s sourcing strategy align with current farmers’ practices and produce?</i></p> | <p>Since the fruits are cut and dried, there are little quality requirements, such that local farmers can easily comply with the standards Tropicaux needs. However, it is currently uncommon for local farms to produce organic. Tropicaux needs to have a clear overview of the agronomic differences between organic and conventional produce to ensure they can offer everything that farmers need to adopt this change of practices.</p> |

Key insights



Key drivers of success

- Tropicaux can successfully source organic pineapples by setting up a block farm scheme. They can easily monitor and trace production, have less risk investing, and need less staff since all farmers are clustered.
- The SDM provides a full package of services that ensures that farmers receive everything they need to produce organic pineapples at high yields.
- Tropicaux is able to offer block farmers a farm-gate price that is above the open market price.
- The SDM is set up independently of donor funding.



Key factors in replication

- The block farm scheme allows for efficient and low-risk service provision and sourcing operations. Tropicaux can control over all aspects of production.
- Farmers are provided with a near full package of services that ensures they have everything required to farm organic pineapples at high yields.
- Tropicaux fully utilizes local capacity by employing AVENIRs. By building on their knowledge and entrepreneurship, the model could be replicated with little additional involvement required from Tropicaux's management.



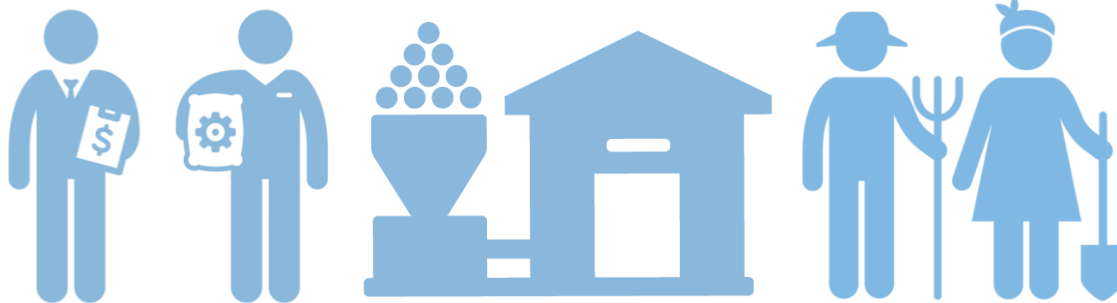
Key risks

- Not all the agronomic requirements and costs to produce organic have been identified yet, and it still need to be proved that farmers can reach the projected yields with organic cultivation.
- There has been little assessment of local interest to join such a scheme. Farmers may find terms unappealing.
- The model is dependent on the capacity of local entities, while Tropicaux can only exert limited control over those.
- It is difficult to replicate or further scale this model in the region, due to a limited amount of land available for purchase.
- The success of the SDM relies on the assumption that farmers are able to finance the uptake of all services, but existing farmers face cash flow issues.



Opportunities for improvement

- Tropicaux can set up a nursery to supply pineapple shoots to block farmers. Currently, there is scarcity of such ratoons in the local market.
- Tropicaux is missing a comprehensive value chain assessment to identify risks and opportunities at farm-level. This is essential to ensure a stable and predictable supply.
- Tropicaux built an ambitious processing plant before identifying risks and opportunities. This company will now need to wait until 2022 before their produce can actually be organic certified as such.



For more information and insights on SDM's, see the [IDH Smallholder Engagement Report](#)