

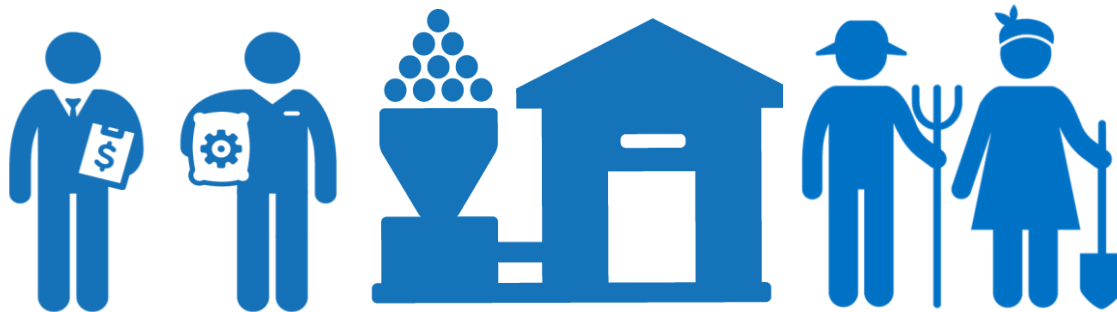
SDM: Mountain Harvest

Service Delivery Model assessment: Short version
September 2019

Location: Mbale, Uganda

Commodity: Coffee

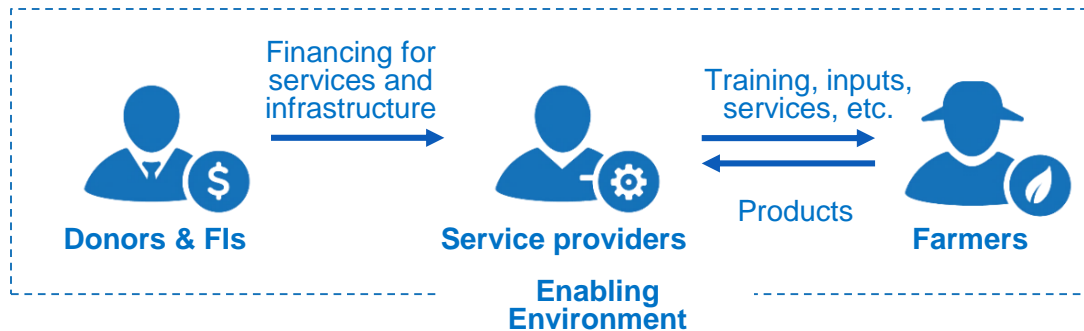
Services: Farmer Organization, Training & Certification, Processing facilities, Organic inputs provision, Professional Services, Access to Finance, Income Diversification



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. The aim is to improve farmers' performance, and ultimately their profitability and livelihoods.

A SDM consists of service providers, often supported by donors and financial institutions (FIs), and farmers receiving the services. All are set within a specific enabling environment.



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

- **Enhanced services**, which lead to improved farmer income and resilience, through higher productivity and product quality
- **Improved SDM outcomes**, which lead to an improved social and environmental environment



SDM operator

- Better understanding of your **business case**
- Insights to **improve service delivery**
- Insights to develop a **cost-effective SDM**
- Identification of opportunities for **innovation** and **access to finance**
- **Comparison** with other public and private SDM operators operating across sectors/geographies
- Ability to 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

Mountain Harvest SDM and objectives

General SDM information:

Location:	Uganda
Timing and analysis scope:	2019-2024
Scale (start of analysis):	715 farmers
Scale (end of analysis):	800 farmers
Funding:	Lutheran World Relief, IDH
SDM Archetype*:	Specialized



- Mountain Harvest is a coffee trader and exporter focused on specialty coffee, MH aims to improve the livelihoods of the farmers it sources from
- Mountain Harvest (MH) was established in 2017 in response to the collapse of the Gumutindo Cooperative. MH works with farmers from six districts on the slopes of Mount Elgon. Its coffees are Organic, Fair-Trade and Rainforest Alliance certified.
- MH aims to decommo­dify its product by providing roasters with top range green beans. To improve the quality of coffee MH invests in heavily in processing (hiring capable staff, training farmers and installing infrastructure). MH will support those farmers from whom it is sourcing parchment in improving their practices via training, kits and decentralized processing stations (now Pulp and Go, later Community Washing Stations). For its highest quality coffees MH is buying cherry and processing it themselves.

SDM objectives:

Vision:

Decommodification to share profits

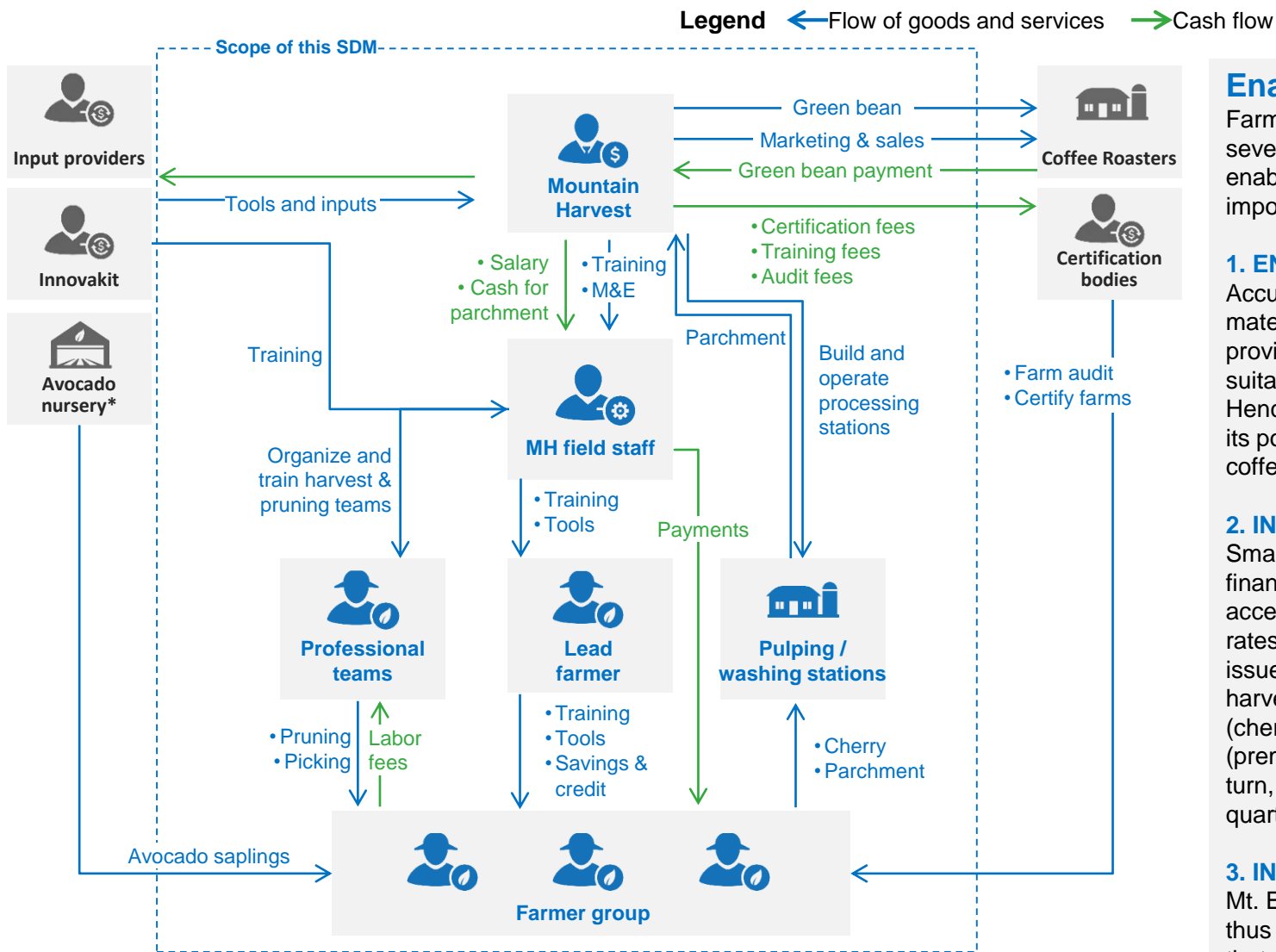
- 1 Sustainably improve coffee quality
- 2 Establishment of multiple processing channels
- 3 Improve farmer household resilience

SDM rationale:



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

Overview of flows of goods, services and cash



Enabling environment

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

1. ENVIRONMENTAL

Accumulation of volcanic material in the Mt. Elgon region provides good soil fertility, suitable for arable farming. Hence, this region is increasing its popularity in the specialty coffee market.

2. INPUTS & FINANCING

Smallholders have no access to finance. If needed, they could access credits at high interest rates. Farmers face cashflow issues, which force them to harvest and sell their product (cherry or parchment) at an early (premature) or late stage. In turn, they would receive only a quarter of the revenues.

3. INFRASTRUCTURE

Mt. Elgon is a highly rainy area, thus is highly prone to landslides that damage infrastructure.

*Plans to set up an alternative avocado supply chain (incl. nurseries) are preliminary and currently not prioritized by Mountain Harvest. There is a willingness to work with partners to roll this out and further improve farmer livelihoods.

Overview of services

Service status

On-going

Design phase



Farmer organization

- MH encourages groups to become saving & loans groups, intensifying their social cohesion
- Eventually farmer groups should be able to manage washing stations together (mixing their coffee)



Training & Certification

- MH field coordinators provide GAPs, farm management and certification related training to farmers
- MH helps farmer in getting their farms certified by Rainforest Alliance, Organic and Fair Trade standards, by training, monitoring and evaluating them.



Processing facilities

- MH builds washing stations with pulpers, water tanks for washing, fermentation drums and drying tables at suitable locations accessible and in proximity of farmers
- MH builds a central processing facility and secure warehouses to store coffee parchment



Organic inputs provision

- MH provides farm tools and implements, such as pruners and shovels to farm groups
- MH introduces smallholder appropriate processing technologies and training to farmer groups to improve quality at the farm level.
- MH sets up compost stations to recycle farm biowaste



Professional services

- MH professionalizes picking and pruning by forming well trained teams that travel from farm to farm to perform such services
- Consistent harvesting methods reduce quality variability



Income diversification

- MH encourages farmers to produce honey and markets the organic honey to their existing coffee roasters
- MH provides avocado saplings to farmers and markets avocados to an off-taker



Access to finance

- MH disburses cash payments in installments during periods of peak cash requirements
- MH extends cash loan advances to farmers groups
- MH connects formed credit and saving groups to banking agents to provide them with access to banking services

Farmers are segmented in this SDM:

Overall, there are four farmer segments analyzed in this SDM. The average farm size (1.5 acre) and tree density (800 trees/acre) have been used as cut-off points to categorize farmers as having either small/large farms and a high/low tree density (i.e. yield) respectively.

Segment 1

- Small farms
- Low tree density

Segment 2

- Small farms
- High tree density

Segment 1

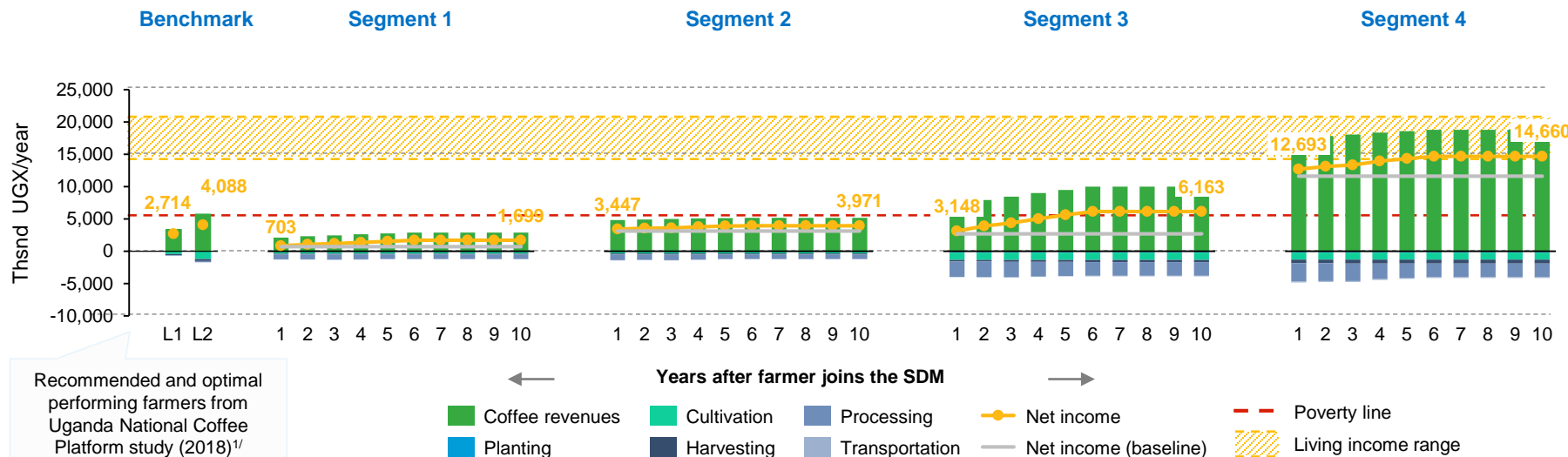
- Large farms
- Low tree density

Segment 1

- Large farms
- High tree density

Projected farmer income over time

Annual coffee income over time
In thousand UGX/year for an average farmer selling parchment per segment



Economic sustainability at farm level

A farmers' sustainability is largely dependent on its starting conditions (i.e. segment). Over time incomes improve as quality goes up, yields improve slightly, and costs go down (see right boxes). As the average per segment is shown, the % of farmers per segment adopting these services influences the pace and size of impact on income over time.

Considering only income from coffee, farmers with larger farms will reach (Segment 3 in year 5) or are already earning (Segment 4) incomes above the poverty line (5,776 Thsnd UGX).

Smaller, high performing farmers (Segment 2) are not able to reach the poverty line with income from coffee only. Corrected for farm size (0.71 vs 1 acre) these MH coffee farmers earn more than "Optimal Farmers" as stated in a study by the Ugandan National Coffee Platform (2018). Only the smaller, poor performing farmers (Segment 1) are troublesome. Even with service provision they cannot get out of poverty.

Main revenue drivers

Better processing practices lead to higher **coffee quality and price**. Assuming most farmers are selling parchment, these graphs only include a premium of 50 UGX, on top of the base price of 6,650 UGX/kg parchment. The impact of sourcing cherry is not shown here, see [slide 38 for a breakdown of impact on annual net income](#) and [39 on how it impact the farmers' cash-flow](#)). **Farm size, planting density and application of GAP**, determine total volumes produced, improving income regardless of higher prices.

Main cost drivers

Processing (pulping and drying labor and equipment) represents around 63% of total expenses. These decrease slightly over time (see Segment 4) as MH takes on more of these activities.

Another cost driver is **hired labor for farm cultivation** (roughly 25%), in turn driven by farm size and total volumes harvested. Activities like weeding, pruning, stumping, fertilizer and pesticide application cost between 5,000 and 20,000 UGX/day depending on the activity.

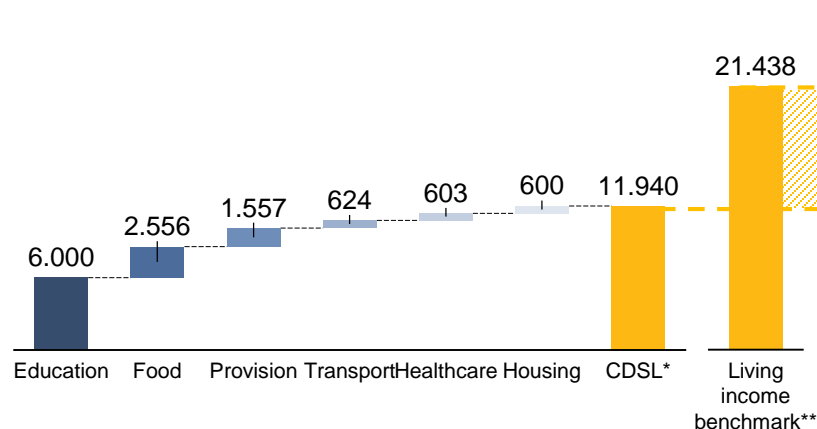
^{1/} Uses the same price as SDM farmers; ^{2/} Uses the World Bank's international poverty line of 1.90 USD/day, adjusted for PPP conversion factor 2011 (private consumption) of 946.9 UGX/USD, an average annual inflation rate of 6.2% for the period 2011-2017, and the average exchange rate of 3,611.2 UGX/USD for 2017. No other household income sources nor income needed for dependents are considered. ^{3/} Phelps and Crabtree (2013) Gallup Median Household Income. Estimates a household of 6 members. Samples are probability based and nationally representative of the resident population aged 15 and older.

Potential ways to support farmers in covering the cost of a decent standard of living (CDSL)*/**

MH seeks to improve the livelihoods of 800 farmer in the Mount Elgon region. Here, we first calculate the income required for a household to cover the CDSL. This includes costs of food, education, housing, healthcare, transport and a provision; and is specific to the region. Together with MH staff these costs have been defined, totaling 11,940 thousand UGX/year for a household of five. The buildup is shown to the left. Second, to the right we compare this CDSL (and the PPP adjusted poverty line) to the annual household income for each farmer segment. While all but Segment 1 farmers are out of poverty, for most segments an income to cover the CDSL is still far away. [See the Annex for the methodology.](#)

Cost of decent standard of living

In thousand UGX/year for a five-person household



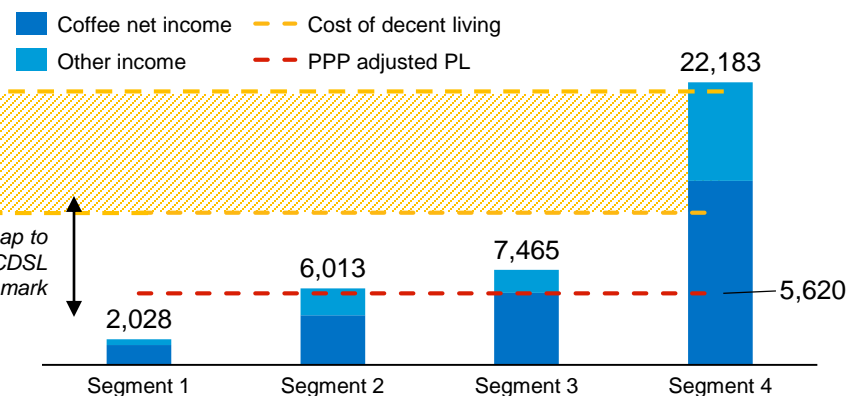
Current income drivers are listed in the right upper table. Other income is assumed to be fixed at 40% of total net household income in year 1 of farmer income projections.

Below table shows per segment what **change in value is required for a single variable** to cover the CDSL. While Segment 4 is already above, Segment 1 appears to be reach the CDSL only through a combination of investing in other crops, increased price and yield.

- OR:** Income from other sources (ugx)
- OR:** Farm-gate price (ugx/kg parchment)
- OR:** Additional yield (kg/acre)

Comparing household net income, poverty line and CDSL

In thousand UGX/year by year five of farmer income projections



Key income drivers (as is)

Farm size (acre)	0.84	0.71	2.96	2.71
Yield (kg/acre)	509	1,127	498	1,063
Farm-gate price	6,480 UGX/kg parchment			

Required change in one of below variables to get to CDSL (low) or Living Income benchmark** (high)

OR: Income from other sources (ugx)	9,913 – 19,400	5,927 – 15,415	4,474 – 13,962	0
OR: Farm-gate price (ugx/kg parchment)	29,505 – 51,571	13,927 – 25,817	9,515 – 15,921	0
OR: Additional yield (kg/acre)	1,525 – 2,985	912 – 2,372	688 – 2,148	0

*Note that this analysis (June 2019) should be seen as a first exploration on what a living income would look like in Mount Elgon region and what would be needed to get farmers to that level. The cost of living is not based on rigorous research, but rather best estimates of various MH staff members. / ** The living income benchmark (November 2019) as stated in the report Living Income Reference Prices for Vanilla – Fairtrade International. This report came out during the MH SDM study and is inserted at a later state for comparability

Sourcing cherry instead of parchment will allow MH to up quality, increase sales prices and pay farmers a premium

1,000 UGX = 0.27 USD

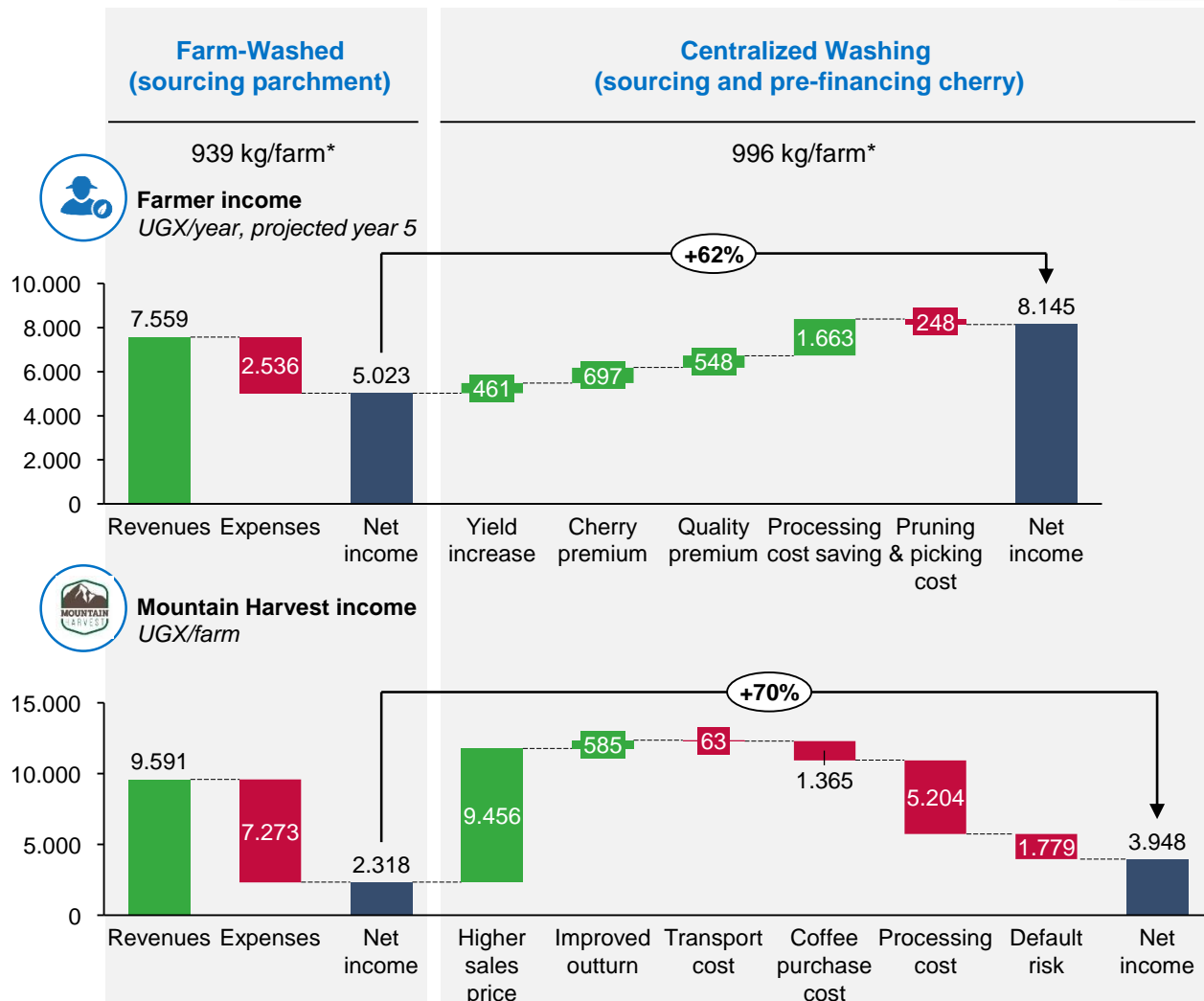
Net income for an average farmer (upper chart) and Mountain Harvest (lower chart) when sourcing parchment or cherry
All figures in ugx/farm/year

Service offering

MH needs to train farmers on GAP, provide composting and professional pruning and harvesting services and pre-finance cherry purchases, while installing central processing facilities to be able to bring average cupping scores in the Mount Elgon region from 83 up to 86. At the same time improved sales and marketing efforts are required to obtain higher prices for the higher quality coffee and increase sales volumes to accommodate for increased farmer yields. If quality and prices increase simultaneously can premiums be paid out to farmers.

Quality and cost savings

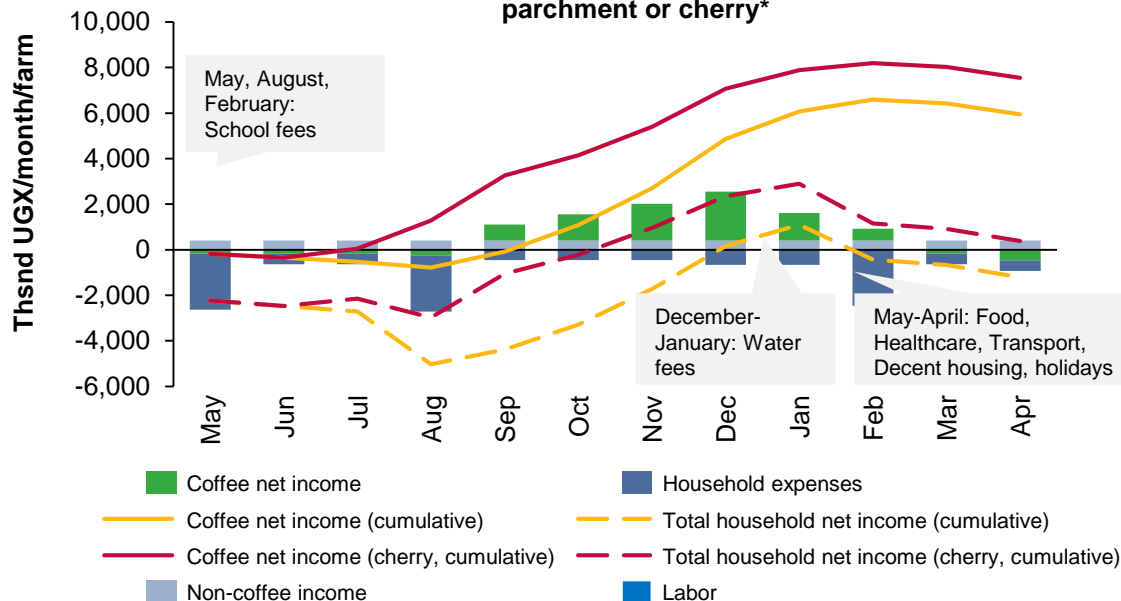
The upper waterfall chart shows how farm-level impact is attributed to the different services. It is interesting to note that farmers, next to the price** premiums they receive, can save considerable on their farm-level processing, which in this case seems to be a value-destroying, rather than value-adding activity.



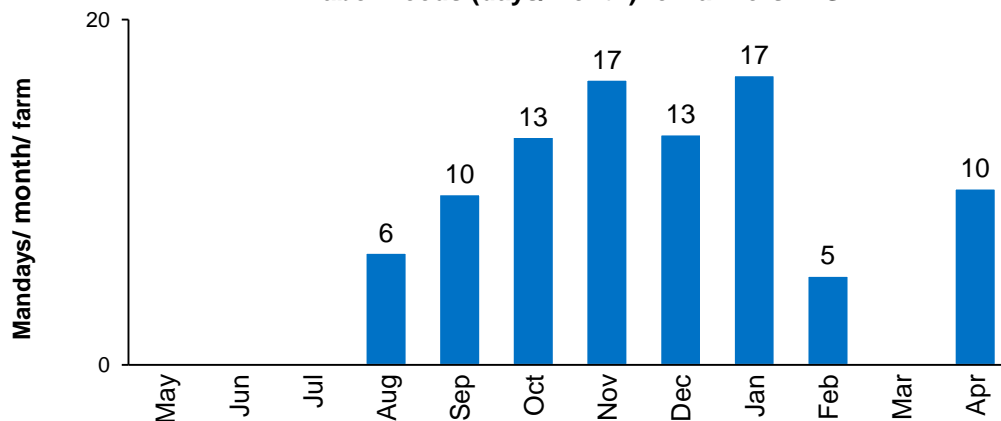
* Volume of parchment sourced by MH per farmer. ** Price buildup: MH pays 1) 50 ugx above competitor prices (base premium); 2) 1,400 ugx per kg cherry (equivalent to 7,000 ugx/kg parchment) versus 6,300 ugx/kg parchment when buying parchment (cherry premium); 3) after testing that coffee meets quality standards, 100 ugx/cherry - 500 ugx/kg parchment equiv. (quality premium); 4) and additional 50 ugx/kg parchment quality bonus on top of second payment.

Farm cash flow cycle throughout the year

Monthly cashflow of an average SDM farmer selling parchment or cherry*



Labor needs (days/month) for farmers in SDM



* The payment scheme under sourcing cherry is aspirational. The default risk is too high to be borne by a single party.

Farm cashflow

The upper graph shows the monthly cash flow and financial resilience of an average farmer in year 1. Farmers have a positive net income from coffee during most time of the year (considering only farm expenses, such as labor, material, other farm expenses, and finance). From March to August, farmers receive no revenues for selling coffee, but do have labor and input expenses. Hired labor expenses (see lower graph) makes up around 50% of total expenses, yet are mostly incurred at times when coffee is sold, resulting in a net positive monthly cash flow.

Household cashflow

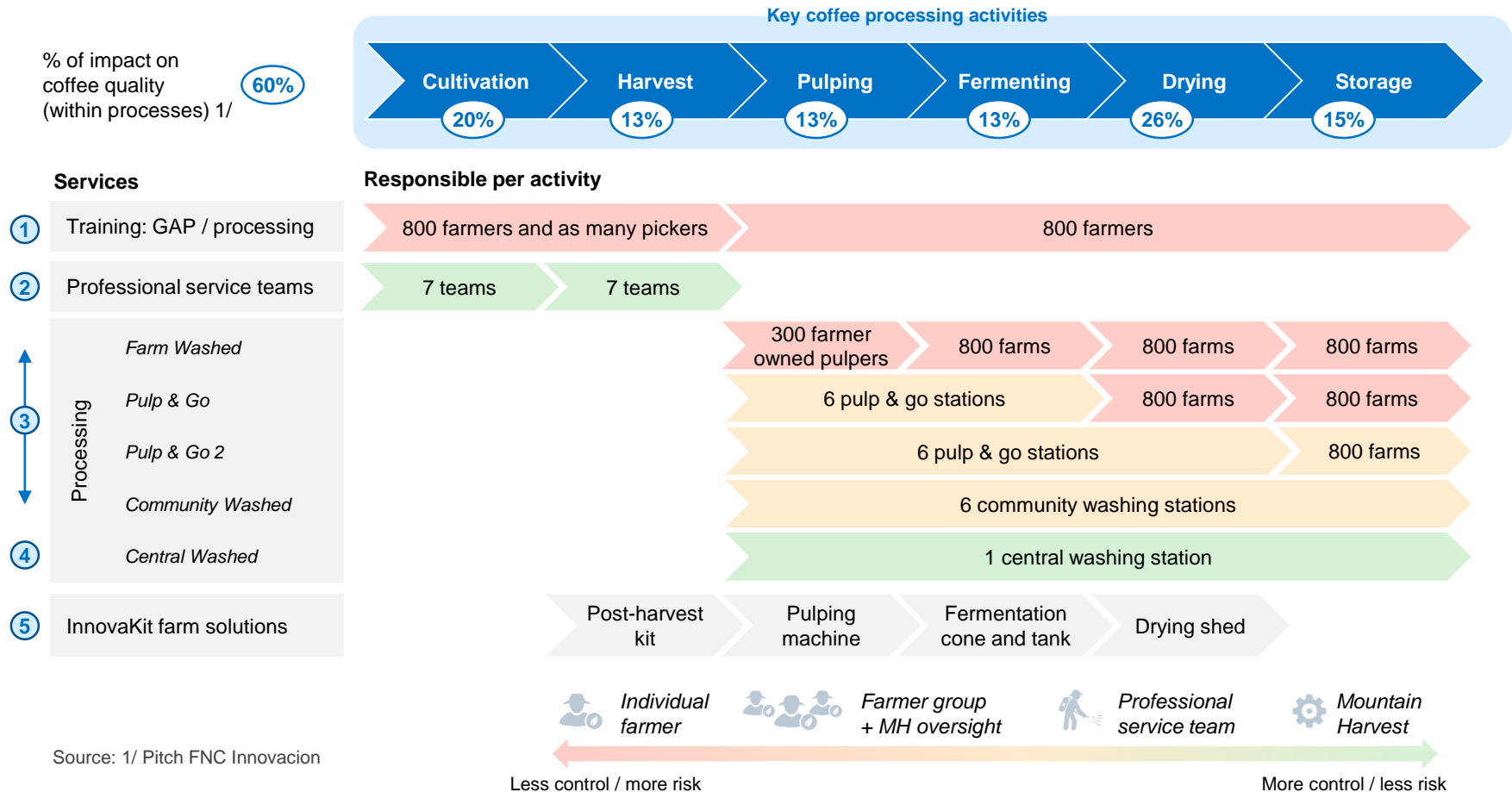
Including household expenses to cover the cost of a decent living, we see that cumulative cashflows are negative throughout the year, except during the end of harvesting season (Dec, Jan). School fees and festive moments (e.g. Christmas) constitute the largest household expenses. School fees are paid in May, August and February.

Incentivizing farmers to sell cherries

Typically farmers process cherry into parchment, hold on to it as a form of cash. This way they prevent themselves from spending all cash at once. However, MH is interested in sourcing cherries from farmers. To achieve this objective, farmers need to be convinced there are alternatives to keeping parchment as cash equivalent. MH could either create stable payment structures, such as cash advances or staggered payments, or introduce agent-based banking into the region to improve farmer access to credit.

Producing high quality coffee efficiently requires minimal points of control, training people and effective farm-equipment

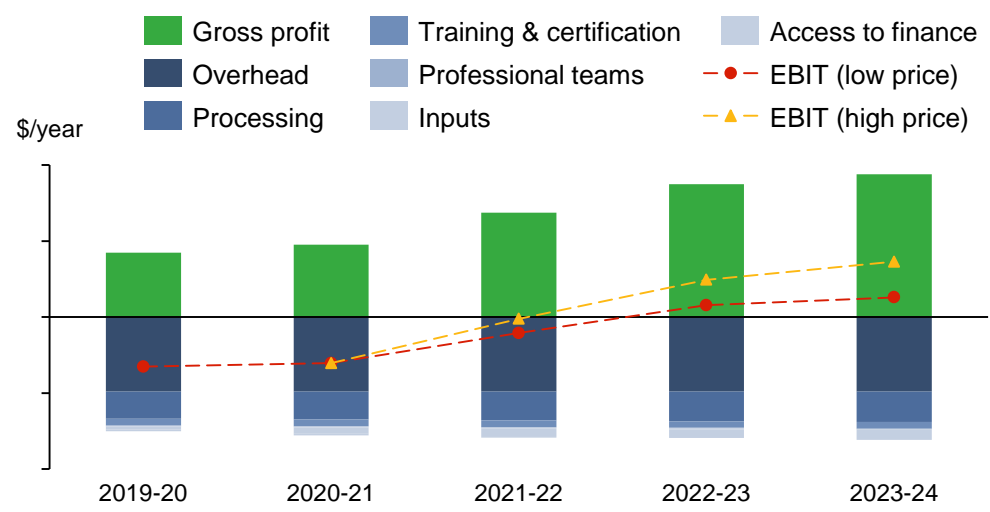
At every step in the process the cherries or parchment can be damaged, negatively affecting the final quality of the coffee (outturn rate, cupping score). To minimize that damage, ① farmers will be trained on farm and processing practices; ② professionals will be trained and hired by farmers; Mountain Harvest will employ and train staff to minimize points of control and manage the process ③ decentralized - together with the farmers, or centralized ④ - within own control. Additionally, ⑤ Innovakit's affordable, farmer co-designed, cultivation and post-harvest solutions will be introduced to further reduce variability in coffee quality.



Source: 1/ Pitch FNC Innovacion

Mountain Harvest P&L, scale and efficiency

Mountain Harvest P&L (\$/year)

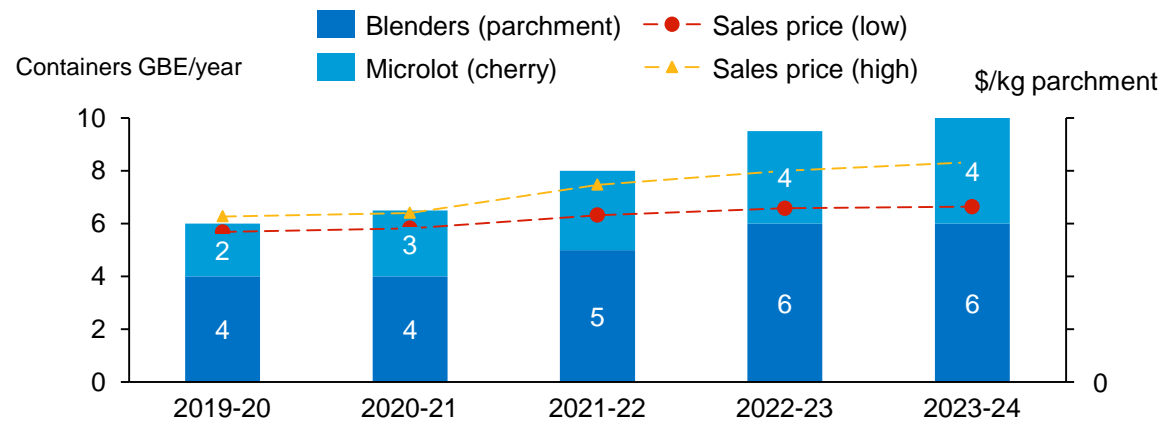


SDM economic sustainability

MH requires relatively large upfront investments before becoming profitable. Profitability is driven by the ability of MH to improve coffee quality and outturn rates, thereby receiving higher prices from roasters. For MH to reach their projected EBIT by 2023/24 key elements must be in place:

- Capable management team with support from Innovakit to be able to implement the envisioned strategy of quality improvement and continuous learning
- Quality enhancing service packages (composting, pruning, harvesting, processing tool) are effective and affordable for farmers
- Mutual beneficial contracts with farmers willing to sell cherry directly to MH
- Properly managed and maintained washing stations able to deliver projected volumes of quality coffee for both blenders (bought as parchment) and microlots (bought as cherry)
- Strong relationships with roasters enabling MH to receive better prices.

Mountain Harvest sales and average sales price (containers and \$/kg parchment)



SDM costs

- Gross profits includes raw materials, hand sorting, shipping and direct marketing costs.
- Overhead (61%) includes salaries, office, utilities, and admin
- Processing (25%) includes depreciation and maintenance of the P&G and Washing Stations
- Services cost mainly consist of staff salaries, materials and finance costs (e.g. tools, seedlings)

Learning questions (1/2)

These results do not represent an official assessment of SDM success or failure by IDH or NewForesight. An indication is given based on the analysis done in this forward-looking study and assumptions provided by the SDM operator(s). Actual assessment should be done during and after the SDM, using measured data

In this SDM study, a set of tailored learning questions were analyzed:



SDM Structure

- How efficient and effective is MH under different processing set-ups?
- MH is sourcing and selling coffee as blenders (farm washed and sold as parchment) and micro lots (bought as cherry and processed centrally). Better managed processing activities result in higher cupping scores (thus higher FOB prices) and better outturn rates (resulting in lower parchment volumes required to fill up a 19.200 MT green bean container). Both setups have different operational challenges and quality outcomes. For blenders, farmers need to be trained, start managing the washing stations collectively, while MH needs to ensure consistent quality across Mount Elgon. For microlots the main challenge is convincing farmers to sell their coffee as cherry, pre-financing it and transporting to the factory in a timely manner. While buying parchment is significantly cheaper per kg of parchment, the improved quality and outturn rates make the central processing setup more profitable.



Financing

- Are the current services provided financially viable over the long-term?
- Above mentioned increases in quality (cupping score) and efficiency (outturn rates) cover the cost of installed processing capacity and additional direct service expenses (input provision, diversification). Professional pruning and harvesting services are expected to be self-sustainable as a business case exists for teams and farmers (higher coffee sales from better harvesting outweighs professional harvesting costs). Overall, these services improve farmer incomes \$/year resulting in sustainable relationships. The main costs centers – essential to make this a successful SDM – are a strong management team; cost-effective processing facilities, Innovakit's expertise and tools,; and marketing, communication and relationship building with roasters.



Services

- How can MH strengthen it's service delivery and commercial relationship with farmers while improving its profitability?
- Relationships between farmers and MH staff are generally good as 1) MH selected 745 out of 1,800 to work with based on willingness and performance and 2) farmers are frequently visited and trained. To professionalize, MH will be gradually organizing farmers by 1) forming them into groups, 2) introducing saving and loan schemes, 3) having them collaborate (e.g. mix their coffees), up to 4) having them jointly operate community washing stations (CWS). MH also plans to rollout strong financial incentives: high quality premiums as cupping scores improve; and paying farmers for their coffee when they need it (pre-financing or staggered payments).

Learning questions (2/2)

These results do not represent an official assessment of SDM success or failure by IDH or NewForesight. An indication is given based on the analysis done in this forward-looking study and assumptions provided by the SDM operator(s). Actual assessment should be done during and after the SDM, using measured data

In this SDM study, a set of tailored learning questions were analyzed:



Services

- How can services be tailored to the different farmer segments?

Farmer segmenting informs rollout of services in three key ways:

1. Type of services provided: provide processing services to farmers with good cultivation but poor processing practices.
2. Cost-effectiveness of service provision: train farmers with large farms and low volumes
3. Sequentially of service provision: for example targeting farmers willing to adopt first, translating positive results in positive word of mouth. Or, targeting farmers most willing to pay first (e.g. in case of harvesting services), improving the service offering before rolling out to other farmers.



Farmers

- How can MH determine the right price to pay its farmers?
- How can the quality and market access strategy of MH benefit farmers and help them to earn an income to cover the cost of a decent standard of living (CDSL)?

The key to improving quality of coffee on Mount Elgon is reducing the points of control (activities where quality can be reduced). Often this means taking certain processing activities away from farmers and bringing these under own control. Improving processing practices together with this relatively small farmer base should ensure MH with a stable supply of increasingly higher quality coffee. Conditional on MH's ability to build long-term relationships with specialty coffee roasters in the USA and EU, MH can pay farmers above competitor prices, with a minimum at 6,450 UGX/kg (this season) for coffee cupped at 83 to up to 7,700 UGX/kg for coffee sourced as cherry and reaching cupping scores of 87. These higher prices directly translate into improved farmer incomes.



Application & Impact

- How can multi-cropping services - further improving household resilience- be rolled out in a financially sustainable way?

While most farms in the region are already substantially diversified, introducing avocado and honey for export can significantly boost incomes in the region. Both products are no high priority for Mountain Harvest (yet) because of capacity constraints and MH's focus on improving coffee quality. While there is an interest to support such alternative supply chains, there is no clarity yet on costs and financial sustainability.

1. For avocado, MH could play a facilitating role in connecting an avocado exporter with suitable coffee farmers and for example distribute seedlings through its existing network. Collection, storage, transportation, and export costs would then be born by the exporter.
2. For honey, MH would first need to test for and create demand with existing coffee roasters. There is no clarity yet on honey cultivation, collection, processing and exporting costs.

SDM driver of success and opportunities for improvement



Drivers of success

Description

Convincing farmers to collaborate

- In order to gradually shift to community washing stations and minimize damage done to the coffee beans during processing, MH will need to make sure farmers trust each other, so that they will mix their coffee and perform processing activities together

Ability to buy cherries

- If MH wants to buy cherries (allowing tighter control of processing), MH would need to develop payment agreements (cash advance, staggered payments) that farmers understand and are willing to work with
- MH should also make sure there is enough cash available at buying stations, potentially by facilitating an agent-based banking model

Building relationships with roasters

- The investments in coffee quality and service provision can only be sustained as long as MH is able to build and maintain relationships with specialty coffee roasters and gradually selling their coffee at higher prices

Having a strong team that combines long-term strategy with operational excellence

- A considerable shift in mindset is needed from the team, away from a simple buying relationships with coops, towards an innovative strategy that focuses on improving coffee, quality while adding value to farmers
- Key functions need to be filled (e.g. data management, agronomist, additional quality control)



Opportunities for MH

Description

Include a clear gender strategy

- Empowering women to manage the business finances might reduce the need for keeping parchment as cash equivalent

More emphasis on diversification

- Facilitation the providing and sale of avocados will improve farmer incomes and resilience, while potentially increasing loyalty to MH
- Setting up a honey sourcing structure can further improve farmer incomes while MH can sell this as an additional product through existing channels

Improving data gathering, management and analytics

- An efficient data collection system capturing the right data points along the value chain will allow MH to pilot, learn and adjust their service and sourcing strategy
- Building on and working together with IDH, MH could get its farmer segmentation strategy right, allowing effective tailoring of service delivery



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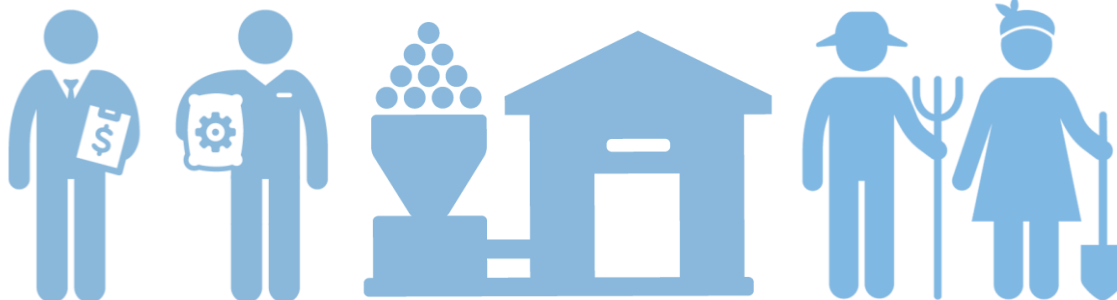
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For more information, see the [IDH Smallholder Engagement Report](#). This report, gathered by analyzing over 30 individual SDMs in 16 countries, provides insights into IDH's data-driven business analytics. The findings identify drivers of farmer resilience, cost reduction and financial sustainability in service models and the conditions needed for a supporting enabling environment.