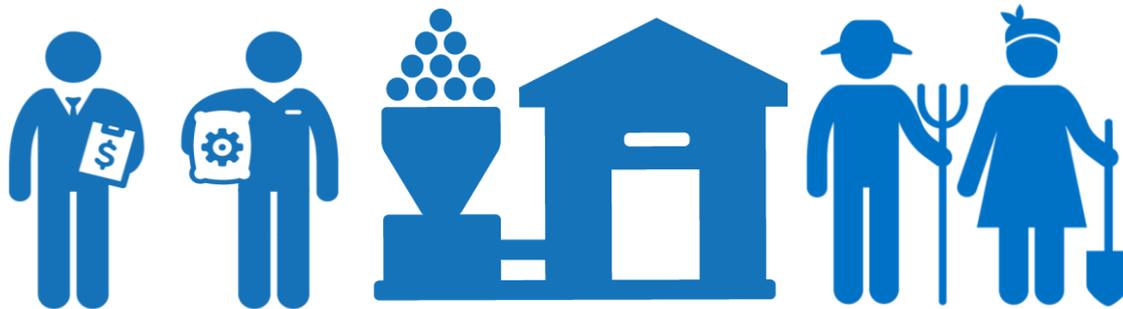


# SDM: KPD Tanzania

Service Delivery Model assessment: Short version  
September 2019

Location: Kayanga, Tanzania  
Commodity: Coffee, Maize, Beans  
Services: Farmer Organization, Training & Certification, Finance & Digitalization, Planting materials, 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

# KPD Tanzania SDM and objectives

## General SDM information:

Location:	Tanzania
Timing and analysis scope:	2018-2024
Scale (start of analysis):	8,271 farmers
Scale (end of analysis):	30,000 farmers
Funding:	AGRA, CIAD
SDM Archetype*:	Local Trader



**KADERES PEASANTS DEVELOPMENT**

KPD COFFEE

- KADERES Peasants Development Plc (KPD) is a Tanzanian-registered public company, consisting of 8,271 shareholder farmers, with over 10 years experience buying beans, and organic and fair trade coffee.
- Headquartered in Kayanga, the Kagera region, KPD Plc currently works with 20,000 local bean farmers and 8,000 local coffee farmers in two districts namely Karagwe and Kyerwa.
- KPD is looking to expand to 100,000 bean farmers in the coming years, with the majority of their product destined for export.
- Bean products are exported to the East-African market and the World Food Programme (WFP), with planned expansions to Canada and Asia. Coffee products are exported to European and USA markets.

## SDM objectives:

### Vision:

Become a diversified agri-business increasing farmer incomes in the region

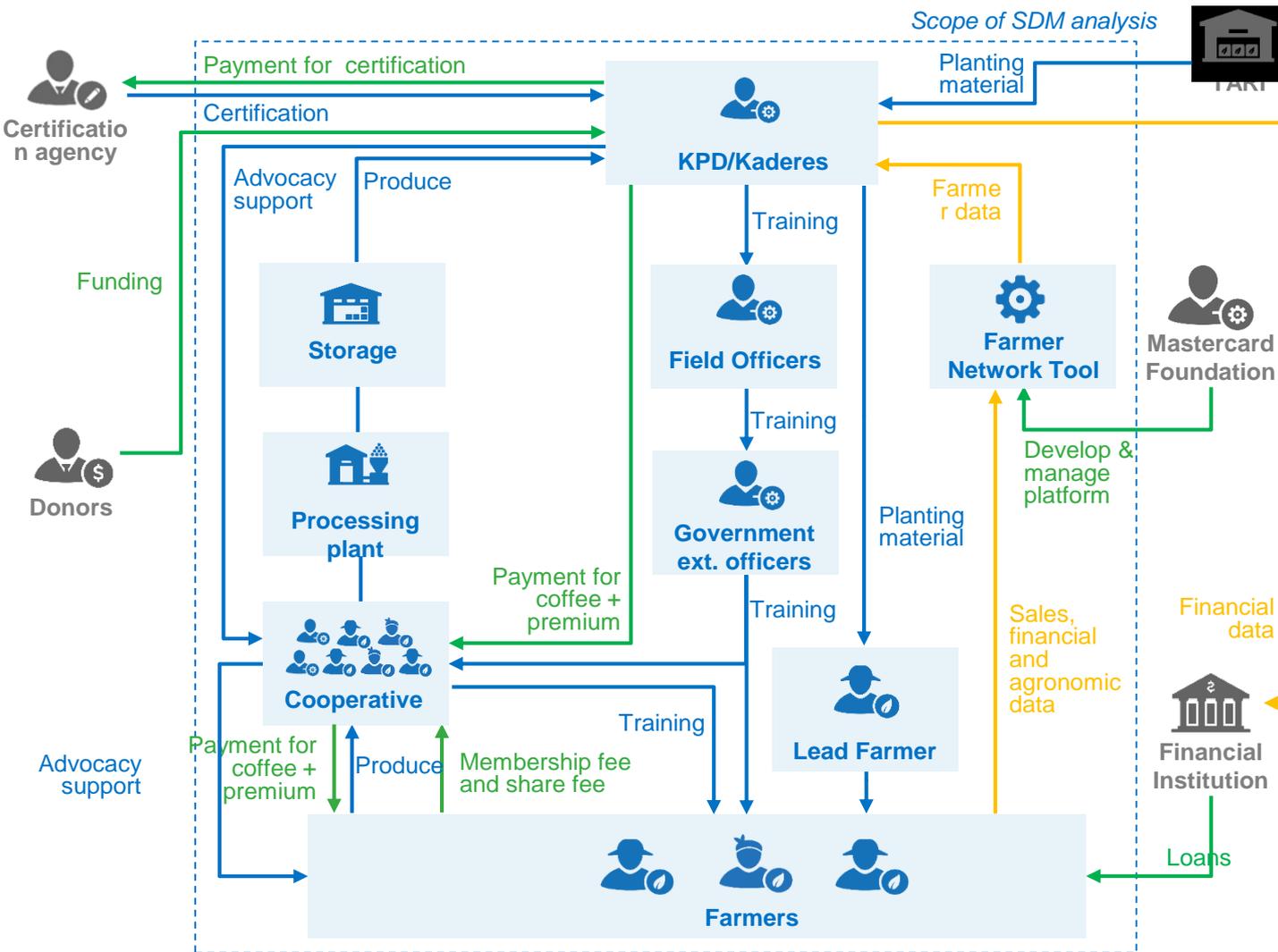
- 1 Increase high-quality Robusta coffee sales
- 2 Diversify into and scale up food crop production
- 3 Improve farmer household resilience

## SDM rationale:



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

# SDM Overview



**Legend** → Flow of goods and services    → Payment    → Information/data

## Enabling environment

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

### 1. PRICING & COMPETITION

Unfair trading practices exist throughout the supply chain due to a lack of transparency in the price setting. Additionally Tanzania has an unpredictable tax regime with ad-hoc export bans for crops (including beans) and inconsistent VAT policies leading to higher costs for farmers

### 2. INPUTS & FINANCING

Farmers' use of inputs is low due to low credit access, weak seed production systems, input infrastructure and the high presence of counterfeits.

### 3. INFRASTRUCTURE

Most roads in rural areas are unhardened which increases transport costs and limits market access.

# Overview of services

Service status

On-going

Design phase



## Farmer organization

- Under the new regulatory environment that has been implemented in 2018, KPD can no longer directly source cash crops from farmers
- Due to this new regulation cooperatives are being created with the assistance of the government and KPD
- KPD will now help unite the 8 newly created cooperatives under a united entity; this entity will be trained and supported by KPD to advocate on behalf of farmers
- KPD advocates to the local, regional, and national governments on farmer matters



## Training & Certification

- Farmers are offered training on GAP, crop diversification, climate change and health issues via the cooperatives and government field officers
- KPD provides training and tools to the government trainers
- KPD provides training to the cooperatives' members, who pay for the training through their annual membership fee
- KPD organizes the FairTrade and Organic certification for the coffee farmers, including training on standards, and support on recordkeeping and auditing to the farmers



## Planting material

- During a 1.5-year project, KPD purchased high yielding bean seeds from TACRI and sold these seeds, below purchase price
- KPD subsidizes this cost to encourage lead farmers to grow the beans and sell the seeds to other farmers in the region
- This ensures KPD has access to a sufficient supply of high-quality beans that meet the market demand, while offering a means for lead farmers to diversify their income



## Finance & Digitization

- MasterCard provides an integrated management system to capture agronomic and financial data from farmers
- KPD uses this system to validate purchases
- Farmers use the system to understand their productivity and sales, and in the future can use it to access finance
- The tool will be used to ensure credibility of expected incomes and yields, which will allow farmers to receive loans against expected financials of the coming seasons



## Income diversification

- KPD provides a cow to farmers through a loan mechanism in which the farmer repays the loan over the lifespan of the cow with the annual income earned from the cow
- KPD supports farmers in acquiring beehives for honey production

## Farmers are not segmented in this SDM:

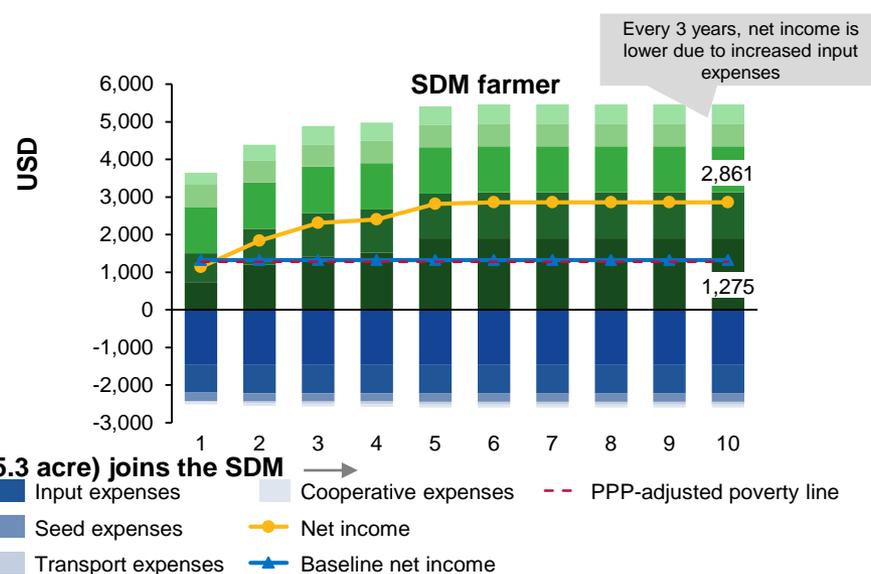
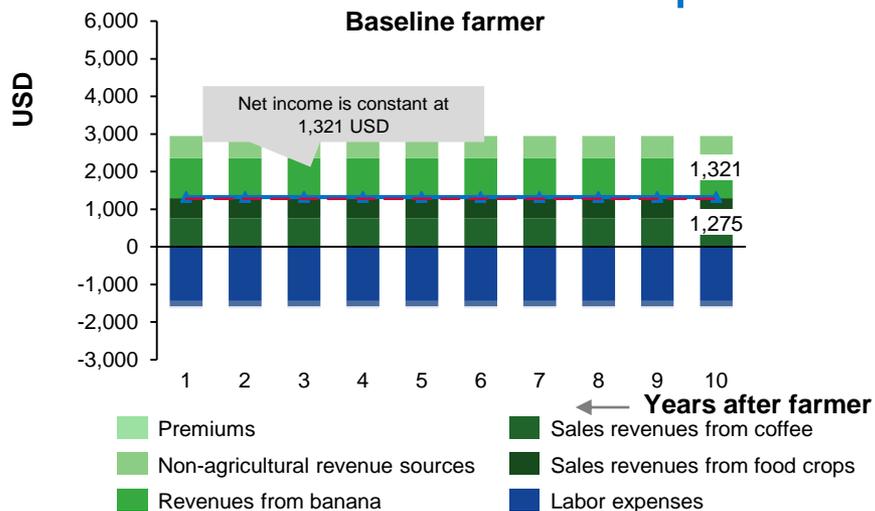
KPD does not offer different packages of services to different farmer segments – all farmers are eligible for all services, as long as they comply with Organic and Fairtrade standards for coffee.

There is no farmer data available to inform design of value propositions to farmer segments based on their wants and needs.

Farmers in the region manage well-diversified farms. Typically the main income comes from 1) banana (45%), 2) coffee (40%), 3) beans (13%) and 4) other (2%).

Farmers usually own two plots. One is organically managed and used for intercropping, while the other is managed conventionally (e.g. chemical fertilizers are allowed) and is used for crop rotation.

# Farm P&Ls: overall impact\*



## Economic sustainability at farm level

In the first year, the SDM farmer earns less than a baseline farmer due to increased expenses in manure and coffee mulch, slightly higher expenses for high-quality seeds and participation in cooperatives. From year two onwards the SDM farmer is better off, mainly because of increased earnings from applying GAP, using high-yielding seeds and additional income from coffee premiums. Net income of the SDM fluctuates throughout the years, which is due to a recurring large necessary investments in inputs every 3 years.

A baseline farmer earns slightly above the PPP-adjusted poverty line at 1,275 \$/household/year\*\*, while an SDM farmer will earn on average 1.8 times more than the poverty line. While this higher income level can provide a buffer against negative events, farmers' income remains highly sensitive to external factors such as prices, weather conditions and pests.

As coffee trees in Kagera are old and beyond their peak productivity, revenues from coffee will continue to decline over the next years. It is key that farmers either undertake rejuvenation to ensure the long-term viability of their coffee farms (see [replantation](#)) or further increase their efforts in income diversification.

## Main cost drivers

- **Labor:** The major cost driver for the baseline farmer is labor (88%), especially the activities related to land preparation and harrowing. Labor cost only slightly increases (from 1,442 to 1,463 \$/farm) for SDM farmers due to the extra hired labor needed for applying the manure.
- **Inputs:** The use of fertilizer is very low for a baseline farmer (1%). The application of organic fertilizer such as manure and of coffee mulch is the major cost driver for the SDM farmer, equal to 29% of total costs. Mulch and manure are only applied once every three years. Costs in this analysis are averaged out over the years.

## Main revenue drivers

- **Production:** Farmers applying GAP may improve their yields by 37% on average for coffee, beans, maize and cassava. Using improved seeds for food crops further increase yields, up to 300% for maize. Production improvements lead to a 121% increase in sales revenues and a 4% increase in net income compared to the Baseline farmer.
- **Coffee quality:** SDM farmers receive a premium for Organic and FairTrade coffee of 0.30 and 0.09 USD/kg respectively (compared to a farm-gate price of 0.47 USD/kg for the baseline) due to higher quality cherries, leading to an average 35% increase in income.

\* This P&L is an optimal scenario where field staff, services, and adoption by farmers are all optimized and expanded upon. Realistically, achieving these outcomes may be difficult under current plans and operations. \*\*The World Bank's poverty line of 1.9 USD/person/day, corrected for purchasing power, requires a net income in Tanzania of 255 USD/person/year (584,621 Tzs/person/year). For a household consisting of 5 members this equates to 1,275 USD/ household/year

# Coffee price evolution and sensitivity analysis

Monthly world market Robusta coffee prices (USD/kg) <sup>1)</sup>



## Volatility of coffee prices

The graph on the left shows the monthly world market prices for Robusta coffee. These prices can vary up to 40% annually, current prices are close to historical low.

These low and volatile prices pose a risk for the smallholder farmers and the SDM, as their income depends for more than 50% on the farm-gate price <sup>2)</sup>.

## Sensitivity of farmer income

The below table shows a sensitivity test of net income at varying price and production levels for a baseline (red box) and SDM farmer (blue box) in year 10.

Changes in price have relatively less impact on SDM farmers; if an SDM farmer would receive the same price as the baseline farmer (0.47 USD/kg coffee), then his net income would decrease from 3,972 to 2,954 USD, still 1,998 USD more than the baseline. This is due to the additional income from premiums and the higher yields from beans, maize and cassava, which increase the farmer's resilience against price and productivity changes in coffee.

The PPP-adjusted poverty rate in Tanzania is 1,275 USD/person/year. Both baseline and SDM farmer remain above it. However, for the baseline farmer a small decrease in production (e.g. due to droughts), or price (see lowest global price) will push him into poverty.

It is important to note that farm-gate prices are only 30% of the world prices, which is substantially below average. This impacts farmers incomes (potential underestimation), and influences the SDM's profitability significantly (potential overestimation).

Coffee world market price (USD/kg)	Farm-gate price* (USD/kg)	Farmer annual net income (USD) for varying coffee prices and production (avg of 7 years)					
		← Coffee yield (kg) →					
		41%	61%	100%	129%	159%	
		175	259	426	594	677	
2.69	170%	0.80	1,634	2,151	3,185	4,219	4,736
2.54	160%	0.75	1,543	2,033	3,012	3,991	4,481
2.24	140%	0.66	1,360	1,795	2,666	3,537	3,972
1.94	120%	0.56	1,177	1,558	2,320	3,082	3,463
1.63	100%	0.47	994	1,320	1,974	2,627	2,954
1.48	90%	0.42	902	1,202	1,801	2,400	2,699

Price includes premium

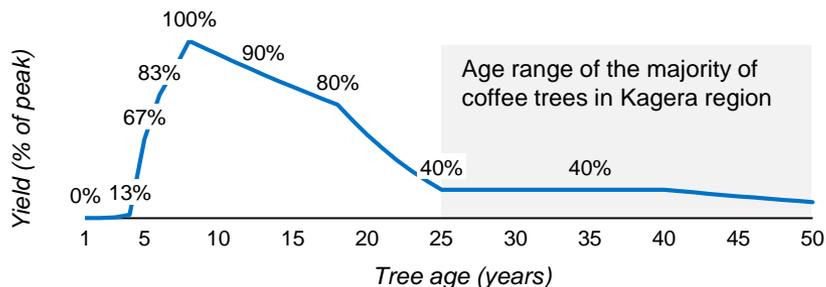
SDM farmer projection (blue box)  
Current projection (red box)  
Below poverty line (dashed box)

Sources: 1) ICO indicator price, average Bremen/Hamburg markets price, indexmundi.com; 2) Global coffee Platform (2016) AFRICAN COFFEE SECTOR – Tanzania case study

# To increase coffee yield and incomes, and ensure long-term supply, local partners need to jointly invest in rejuvenation infrastructure

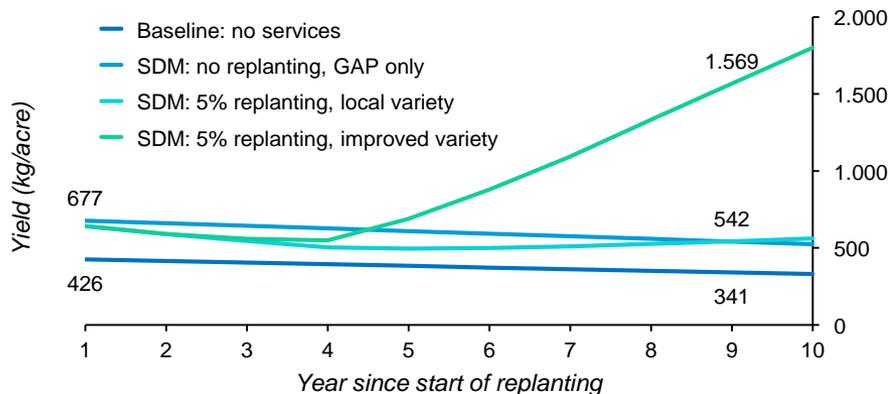
## Robusta coffee yield curve <sup>1)</sup>

% of peak yield by tree age



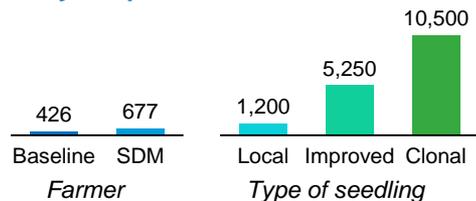
## Replanting potential <sup>2)</sup>

Yield (kg/acre) over time for different replanting scenarios



## Current yield <sup>2)</sup> and yield potential <sup>3)</sup>

Kg/acre



## Rejuvenation is necessary but a challenge

- Robusta coffee yields are low (on average at 40% of peak potential) and declining. Most trees are local varieties planted between 25 and 60 years ago.
- Today, some farmers are stumping or replanting trees, at rates of around 1.5% of total trees per year. These low rates are the result of a lack of awareness, motivation and/or capital of farmers to replant effectively. The main costs are replanting labor, seedlings, and lost revenues from removed trees.
- In the region there is limited availability of improved and clonal seedlings, and no effective delivery mechanism in place.

## Under the right conditions, long-term coffee yields and supply can increase significantly

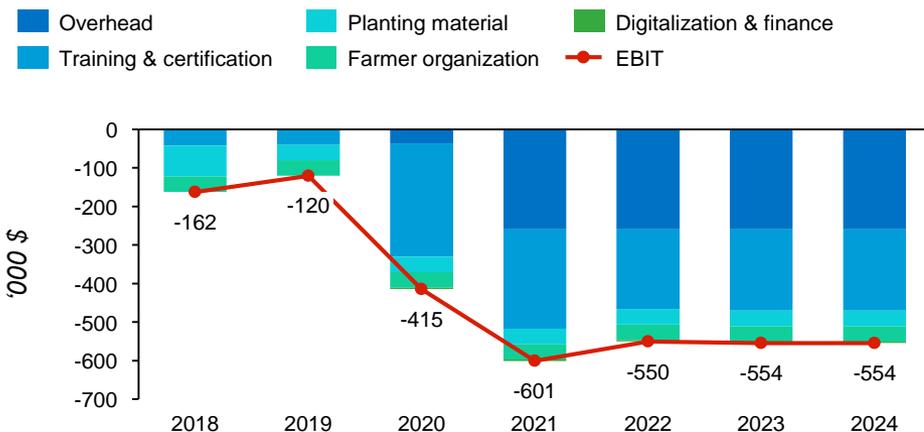
- Farmers need tailored advice on optimal replanting rates and density, and access to quality seedlings and finance.
- TACRI, with additional resources and support of local partners, needs to increase the supply of high-quality seedlings to meet local demand.
- NGOs and traders like KPD need to work together with TACRI to arrange efficient delivery of seedlings. This means using their networks (cooperatives, lead farmers and extension workers) when coordinating the placement and aggregation of orders, and subsequent distribution of seedlings to farmers.
- The envisioned rollout of the Farmer Network Tool will allow for more efficient placements of orders and distribution, and in future, provide access to loans to cover the cost of replanting.

Sources: 1) other Robusta coffee SDM analyses; 2) KPD Farmer Field Books, assumes coffee tree density of 150 trees/acre. 3) KPD field staff interviews, note that clonals are not widely available nor have these yields been observed on farmers' fields

# Service provision is not seen as standalone business; costs are recouped through commercial activities

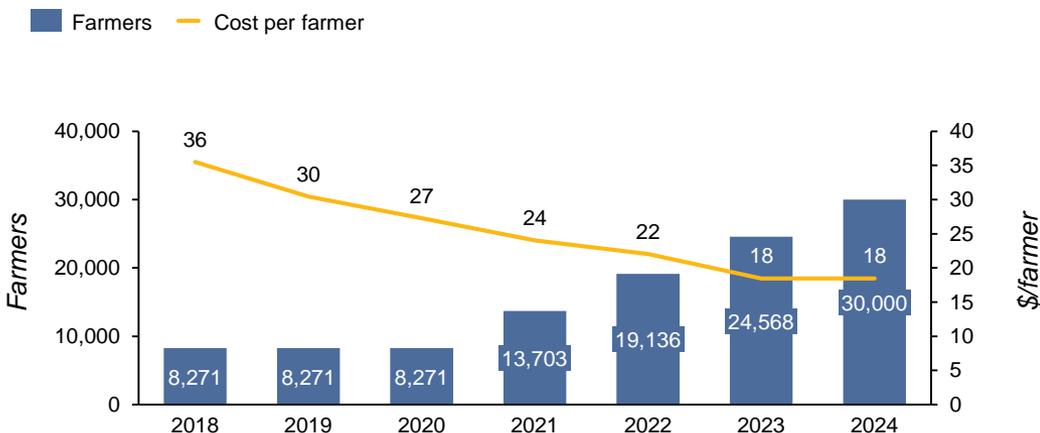
## SDM P&L, excluding overhead and commercial activities

Service revenues and expenses, '000 \$



## SDM scale and efficiency

Number of farmers and SDM cost per farmer (\$/farmer)



## SDM sustainability

- Considering only KPD's service revenues and expenses, an annual loss, stable from 2020 onward, of around \$540,000 is projected.
- This is in line with KPD's strategy, where most service costs are expected to be recouped through increased sales and improved margins. The remainder of the costs is covered by donor funding.
- Service costs are typically not recouped via direct payments, the only exceptions are mentioned below.

## Service revenues

- One-off sales of 40,000 kg improved bean seeds at \$1 per kg.
- Training fees charged to cooperatives for 3 trainings per year at \$125 per training.

## Service expenses

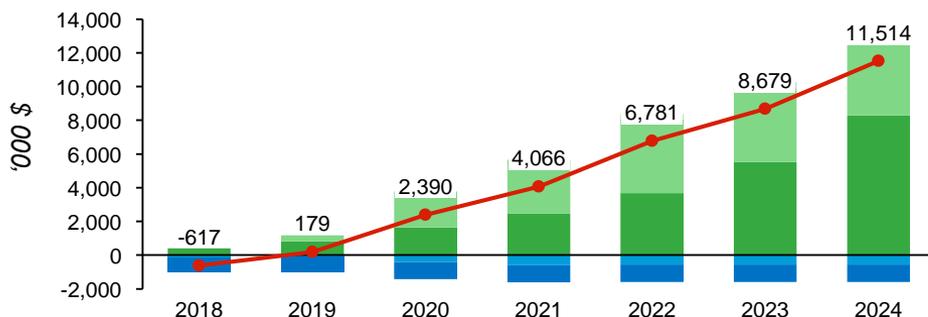
- Annual overhead staff salaries stabilize at \$330,000 by 2021, covering 2 agronomists, 15 KPD field staff (on pay-roll) and 35 governmental extension workers (paid out in-kind).
- Fairtrade and Organic certification audit costs are fixed at \$56,000 each year.
- Bean seeds were bought at \$2 per kg, twice the amount KPD sold the seeds for.
- Smartphones to enter and upload data into the Farmer Network Tool (FNT) are paid for by KPD by 50%.
- FNT membership fees per farmer are covered by CIAD, with no clear exit strategy in place.

# To grow into a sustainable business KPD requires a clear financial strategy shifting away from grants, towards loans

## SDM P&L\*, including overhead and commercial activities

Overhead and service costs; sourcing profits, '000\$

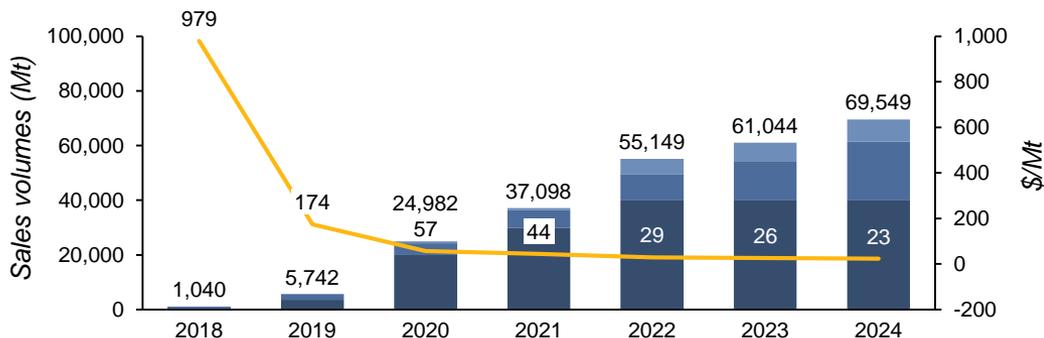
■ Gross profit coffee    ■ Gross profit flour    ■ Net services  
■ Gross profit beans    ■ Overhead    ● EBIT



## SDM scale and efficiency

Sales volumes and cost per Mt produce sold

■ Beans    ■ Flour  
■ Coffee    — Cost per Mt



## SDM sustainability

- Assuming KPD can meet its sourcing targets, it will turn into a highly profitable business.
- However, to meet those targets KPD needs to overcome a range of issues:
  - KPD sources small volumes and struggles to gather enough working capital to bridge the period between procurement and being paid by clients.
  - Investors for additional processing equipment (bean sorting, bean cooking and canning, flour processing) have not been found yet.
  - There is limited evidence of a growing demand for coffee and beans. Efforts of a recently hired sales manager for the European coffee market are too recent to assess. So far, the only expected large-scale bean order (15,000 kg; WFP) has not been placed. There have been no mentions of other recurring buyers.
  - While there are plans to expand the field team, in the past few years it has contracted from 20 to 5, due to financial limitations.
  - This smaller team faces the challenge of not only servicing a growing farmer base but having to do so indirectly through coops and government extension officers.

## Sales revenues

- The SDM's profitability is mainly driven by large Robusta coffee gross margins combined with strong volume growth (from 1,000 to 21,000 Mt) .
- Beans are sold at much larger volumes (40,800 Mt by year 2024) yet lower margins

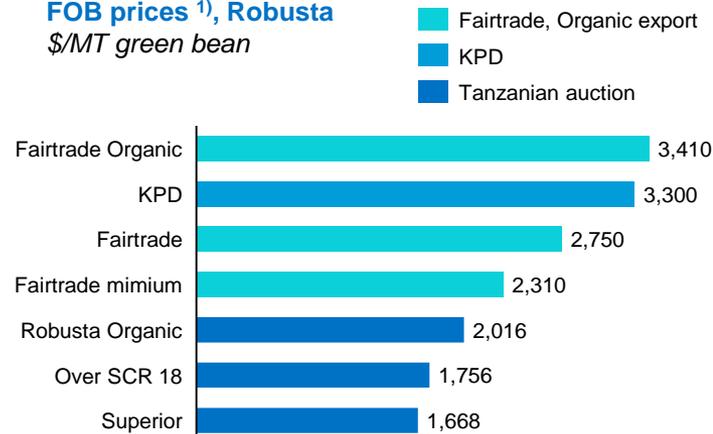
\*Profitability figures have been altered for this public version of the report

# The sustainability of KPDs SDM is highly sensitive to changes in Robusta coffee prices and Costs of Goods Sold (CoGS)

## Coffee revenue projections

- Given KPDs assumptions, profitability is highly dependent on high-quality coffee revenues
- To assess the resilience of the SDM coffee prices and CoGS are compared against market data and literature studies (see right).
  - FOB price:** worst case, if KPD cannot find European buyers for FT Organic Robusta, prices will drop to between 2,016 (auction) and 2,310 (FT minimum).
  - CoGS:** KPD's service and sourcing costs seem to be underestimated, resulting in a 74% versus 14% margin
- Below table calculates the average annual SDM EBIT for varying coffee prices and CoGS. Taking worst case prices (around \$2,000) and CoGS (1,750 \$/MT), profitability of the SDM drops significantly from around \$17.7 million to between 0.6 and 4 million.
- KPD should invest heavily in quality control, and marketing and sales of coffee. It is also advised to improve the understanding of the coffee cost and profit margins and be able to reduce costs where possible.

FOB prices <sup>1)</sup>, Robusta \$/MT green bean



## SDM EBIT (million \$, annual average over 2018-2024)

For combinations of coffee FOB prices and CoGS

CoGS (\$/MT)	FOB price (\$/MT)				
	1,300	1,800	2,300	2,800	3,300
1,000	4.2	7.6	11.0	14.4	17.7
1,250	1.9	5.3	8.7	12.0	15.4
1,500	(0.4)	2.9	6.3	9.7	13.1
1,750	(2.8)	0.6	4.0	7.4	10.7
2,000	(5.1)	(1.7)	1.6	5.0	8.4

## Cost distribution along the Robusta value chain

% of FOB price, comparing KPD assumptions and literature

Item	Literature <sup>2)</sup>	KPD
Farm-gate price	67.5%	24.1%
Service cost	0.0%	0.3%
Trader cost	4.6%	1.5%
Trader margin	5.2%	0.0%
Export processing cost	8.2%	2.1%
Total CoGS		
Exporter margin	14.4%	74.1%
Export price	100.0%	100.0%

Sources: 1) KPD interviews; Tanzanian Coffee Board 2018; Fairtrade minimum price and premium table 2018; 2) Uganda coffee supply value chain analysis; while dated and based on Uganda, this analysis gives a comprehensive benchmark for how costs are distributed along the value chain

# Conclusions: key drivers of success and key risks



## Key drivers of success

### Significant potential for expansion

The processing and warehouse capacity for both beans and coffee is significantly greater than the current utilization and could be further expanded if needed. Moreover, there are large plots of land surrounding both facilities that could further be utilized as needed, if capacity became a constraint.

### Relatively low input and procurement costs

The region of Tanzania that KPD operates has relatively low costs for produce and inputs. This allows KPD to serve their farmers at a low rate and to purchase products at below market values. This leaving room for KPD to outcompete neighboring areas while still having a comfortable bottom line. If either of these factors change, or the quality diminishes to a point they cannot secure the premium prices they require, this may be a challenge.

### Maintain certification and contracts with offtakers

The key differentiator for KPD is their certifications which allows them to export to premium markets. Maintaining these is pivotal to the success of this SDM and their operations.



## Key risks

### No clear strategy and business model

There is no strategy outlined on recouping costs, other than attracting grant funding. This leads to high dependency on sporadic success of attracting donor funds while distorting the KPDs actual profitability and cost charged to farmers.

### Coffee dependency

KPD relies heavily on coffee revenues. 1) Not finding enough offtakers for direct export; 2) selling consistently at lower prices, and/or 3) if production costs are higher than expected (which is probable due to reliance on donor funding and low data reliability, see below) will significantly impact the profitability of KPD.

### Lack of data and misalignment with comparable data

There is no clarity on estimated sales volumes, farmers sourced from, logistics costs and potential scalability. This proved to be a key challenge in assessing the sustainability of this SDM, and will present a challenge improving business operations and when bidding for contracts and on presenting working plans to receive working capital or loans. Moreover, comparable data from nearby regions or actors was significantly different than the presented KPD data.

### Government regulations limiting interaction with farmers

Recent changes to regulation limit KPD's ability to source products and supply services directly to farmers. This threatens to remove their differentiating advantages and makes service delivery more challenging.

### Investments required to scale

To reach the growth figures that KPD seeks will require investment in multiple parts of their business, from processing and staff, to technology and logistics. As working capital is already a constraining factor, gathering further capital for investment may be a challenge



# Lessons learned during the study exercise



## Opportunities for improvement

### Sourcing working capital to purchase volumes

Current storage and processing capacities can handle significantly greater throughput, allowing KPD to purchase greater volumes. However, getting access to working capital to fulfill these purchases has constrained KPD in sourcing further volumes.

### Finding a long-term offtakers that commit to volumes

To help gain access to additional finance or ensure steady working capital, KPD must have steady throughput of both beans and coffee. Stagnant inventory bottlenecks their production and ties capital up. Decreasing the days of product in inventory will allow them to utilize their facilities more effectively

### Ensuring quality of production to sell to premium clients

KPD's key differentiator is quality and access to overseas markets, yet this requires quality product. To do this, they must ensure their producers have access to high quality planting material and use processes that do not damage the product.

### Services can better address key issues for producers

Farmers struggle in accessing high yielding planting material, paying high interest rates, and clarity in market pricing. The current services do not address these areas. By working with external groups (for planting material), banks, and downstream actors, KPD could remedy these issues. Moreover, farmers could use a steady and cheaper supply of fertilizer, as this represents a significant cost.



## Key factors in replication

### Building strong relationships with investors and institutions

A large portion of KPDs success can be attributed to the outfitting of their facilities with state-of-the-art equipment. They have capacity to spare and the capability to deal with multiple crops. This comes from strong relationships with funders and foundations, as well as the ability to put forward valuable proposals.

### Creating strong relationships and trust with farmers

The farmers in the region trust that KPD has their wellbeing as the priority of their organization. This kind of trust has spawned a strong buyer-seller relationship and helps ensure that KPD gets the most, and high quality, product.

### Diversify crops

Reliance on one crop or stream of income, especially one such as coffee with high price variability, may not keep an SDM operating for long. While coffee is by far the most profitable crop and development thereof should be prioritized, KPD should diversify into beans and other crops to strengthen its own business and contribute the development of region.





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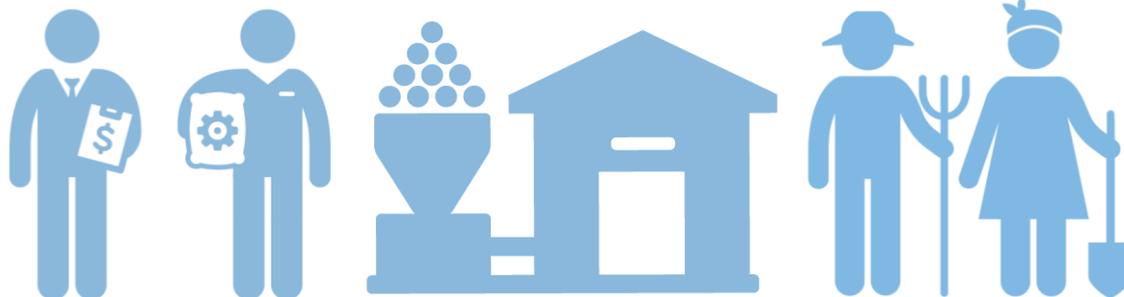
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For more information, see the [IDH Smallholder Engagement Report](#). This report, gathered by analyzing over 30 individual SDMs in 16 countries, provides insights into IDH's data-driven business analytics. The findings identify drivers of farmer resilience,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