# Business case and roadmap for first mile logistics solutions in the coffee sector in Uganda.

REPORT PREPARED BY SÙÚRÙ FOR

CLIMATE CENTER

by Kühne Foundation

# supply chain value and efficiency

Arabica coffee in Uganda

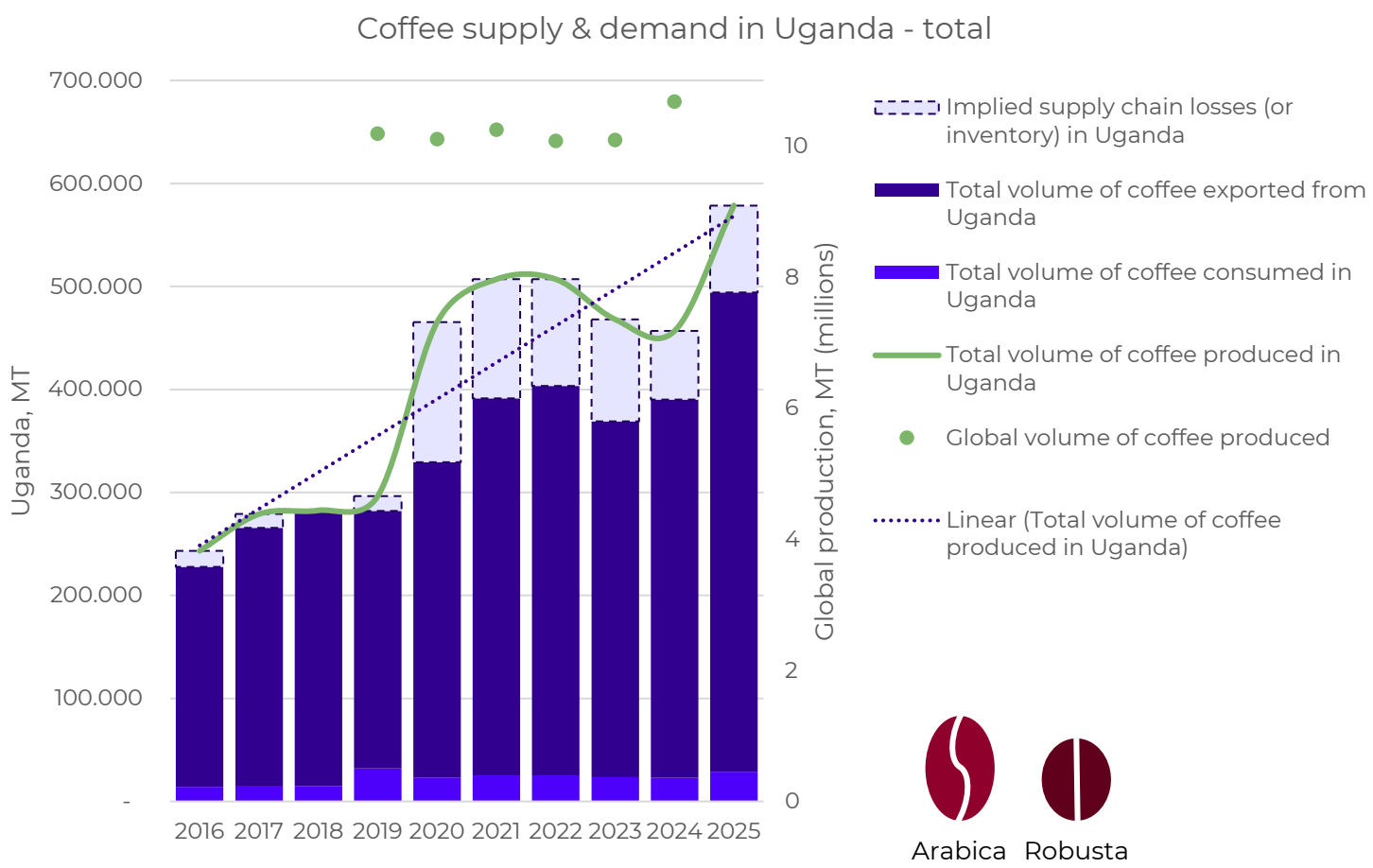
# Estimating supply chain losses

## Combining data sources, a top-down calculation of production, consumption and export reveals supply chain losses.

- Supply chain losses are not always transparent. Farm-level production is not always known, with production being fragmented among smallholder farmers, data has not always been available. Supply chain actors may track losses for their internal management purposes but it is not often shared widely. Export volumes are easier to track based on shipping documents.
- In the past, it was sometimes assumed that all coffee gets exported, but several actors have made an effort to also understand production volumes, which reveals supply chain losses. Not all coffee reaches the market.
- While there is a gap in data, we have used data from several sources to estimate supply chain losses in the sector. The Uganda Coffee Development Authority (UCDA), FAO and ICO publish statistics about coffee production, consumption and export. We have used available data points, with UCDA data as the leading source, complemented with information from other providers where there was a gap, and extrapolation of data points for seasons where data was incomplete.
- With data and estimates for production, local consumption and exports, we see a gap. This gap could be explained in two ways: (1) a portion of the production may not yet reach the market and be stored as inventory, or (2) a portion of the production is lost in the supply chain. By using multi-year averages, the impact of inventory and outliers on the findings is mitigated.
- The data presented in this section is a top-down calculation of sector level losses. We have paired this with a bottom-up estimate based on a farmer survey. Bottom-up and top-down estimates provide similar figures for coffee losses in the supply chain.

# Coffee sector overview

## Overall, there is an increase in production and exports. Implied supply chain losses are 14% on average, and range up to 30% depending on the season.

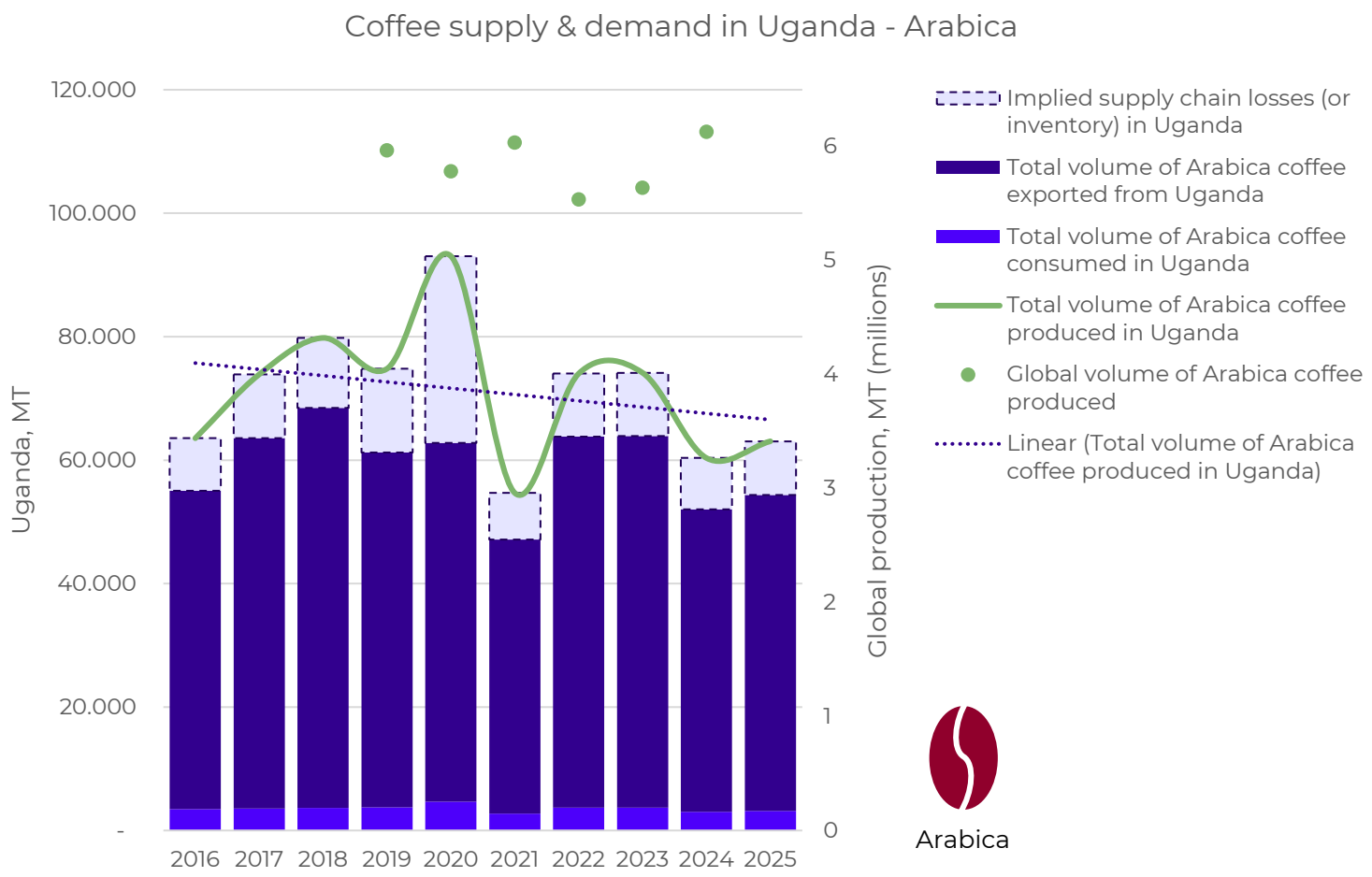



- Overall, there is an increase in production and exports for coffee in Uganda. Implied supply chain losses are 14% on average, and range up to 30% depending on the season. This includes all coffee, including both Arabica and Robusta.
- Bottom-up and top-down estimates provide similar figures for coffee losses in the supply chain.

*Sources: UCDA, FAOSTAT, sùúrù*

# Arabica overview

## Arabica volumes are volatile, differences exist between seasons, and the overall trend is a decline. Supply chain losses are higher in Arabica.



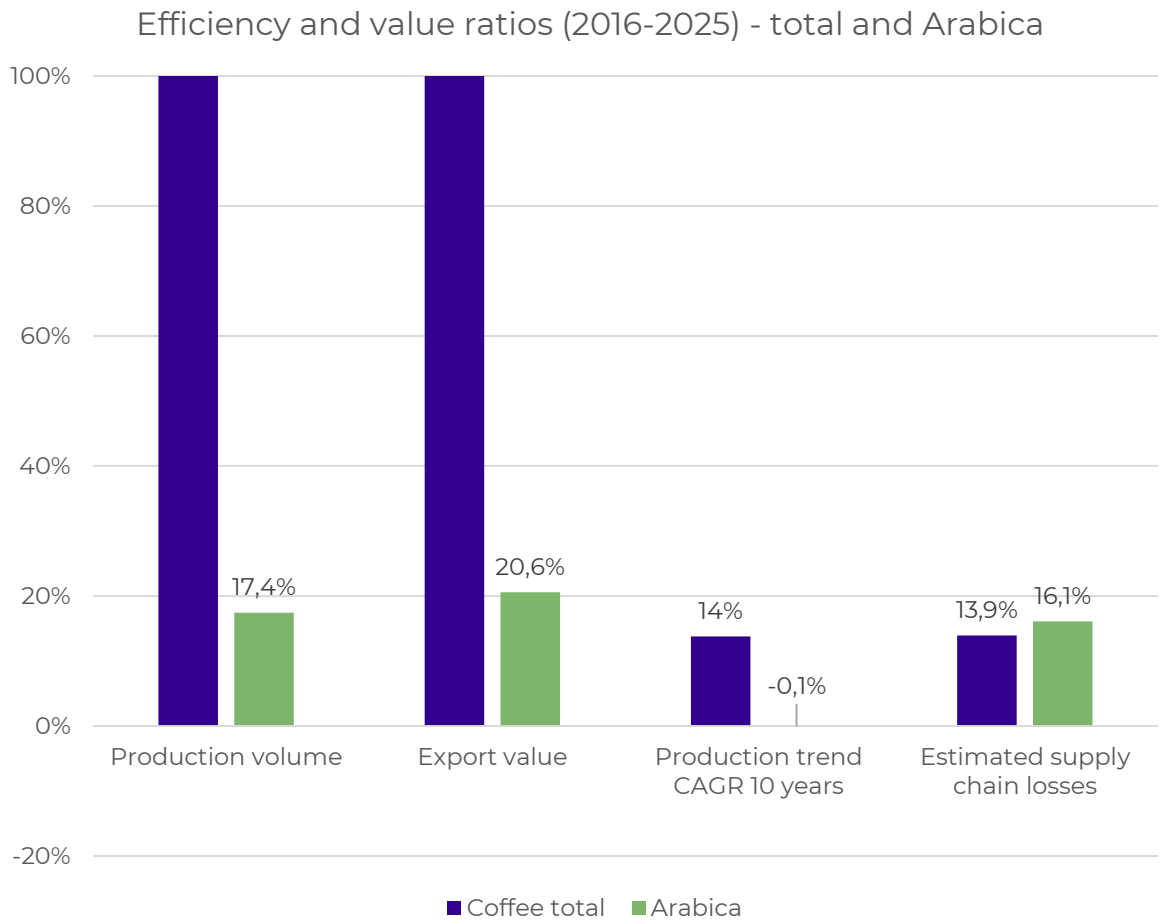

- While coffee production and exports grow in Uganda overall, Arabica production is highly volatile and 10-year CAGR even shows a decline in volumes.
- Supply chain losses are higher in Arabica with 16% on average (compared to 14% in the overall coffee sector) and range up to 33% in some seasons.
- This can be attributed to the sensitivity of the Arabica crop, challenging infrastructure and logistics in remote and high-altitude production areas, and stronger impact of climate change in those areas.

*Sources: UCDA, sùúrù*

# Supply chain efficiency

## Arabica is declining within the total coffee sector in Uganda. Supply chain losses are highest in Arabica.

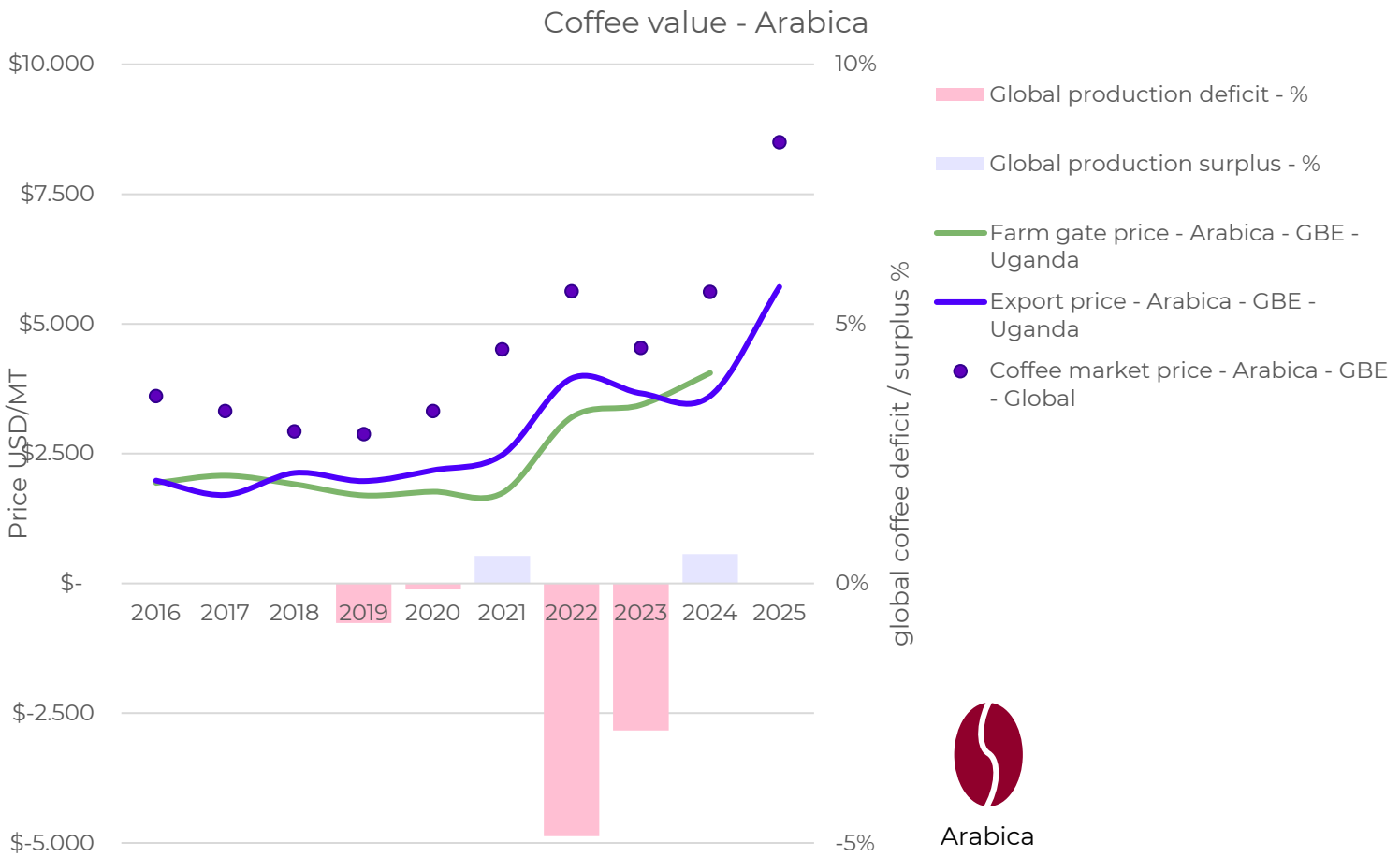
- With a higher value per MT, the export value of Arabica represents 20.6% of the total coffee sector. Arabica exports are estimated to have an annual value of $240 million depending on market prices (ranging from $100 million in 2020 to $300 million at its peak in 2025).
- Arabica represents ~17% of total coffee production volume, has a declining CAGR, and higher supply chain losses compared to the sector overall.
- If the trend continues, Arabica coffee would be at risk of disappearing from Uganda.
- The Arabica sector needs combined interventions to maintain productivity and reduce supply chain losses.




*Sources: UCDA, FAOSTAT, sùúrù*

# Arabica value

## Coffee prices have seen an increase in recent years, in Uganda and globally. Price increases are caused by several years of global supply deficits.




- Coffee prices have seen an increase in recent years, in Uganda and globally. Price increases are caused by several years of global supply deficits.
- Expectations for price development in upcoming years vary widely.
- Climate change is expected to create more global volatility in production volumes, and prices as a consequence.

*Sources: UCDA, ICO, World Bank, Statista, sùúrù*

# farmer insights

Arabica coffee in Uganda

# Household and farm characteristics

## Households producing Arabica are smallholders, with very small fragmented plots of land, and commonly diversified with other crops and livestock.

| | Elgon | Rwenzori |
|---|---|---|
| Average age head of household | 45.7 | 45.7 |
| Average household size (adults + children) | 6.0 | 7.3 |

| | Elgon | Rwenzori |
|---|---|---|
| Average number of farms per household | 3.4 | 1.7 |
| Average farm size (ha/farm) | 0.4 | 0.7 |
| Average total farm size (ha/household) | 1.2 | 1.1 |
| Calculated coffee farm area (ha/household) | 0.8 | 0.6 |
| Farms with intercropping | 79% | 65% |
| Farms with livestock | 90% | 92% |

| | Elgon | Rwenzori |
|---|---|---|
| Average annual yield (kg GBE/ha) | 306 | 290 |
| Average annual volume (kg GBE/household) | 231 | 170 |
| Also has non-farming income | 46% | 39% |

- We conducted a farmer survey collecting primary data on 1st mile logistics, in Elgon and Rwenzori regions, the two primary regions for Arabica production.
- Average age of the head of household is 45 years old, with 25% of farming households younger than 35. This is lower than reported elsewhere, and signals a trend of older farmers retiring and their children stepping in.
- Farms in Elgon are smaller compared to Rwenzori, but with more farms per household total farm area is similar between two regions. Overall, farms are small or very small.
- Farms are commonly diversified, with other crops (often intercropping) and livestock.

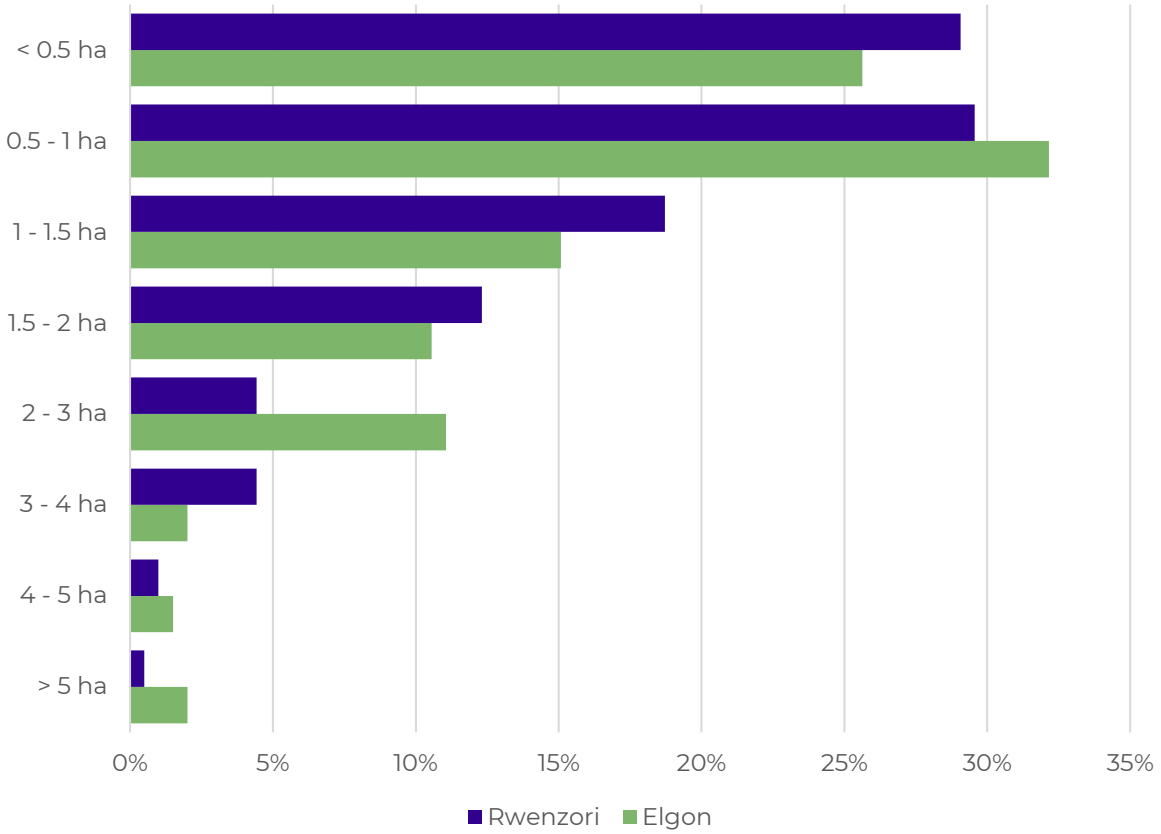
*Sources: sùúrù, Matrice360*

# Coffee productivity

## Coffee production is characterized by smallholder farming, with the majority of farmer owning <2ha, and typically with low yields ~300kg/ha.

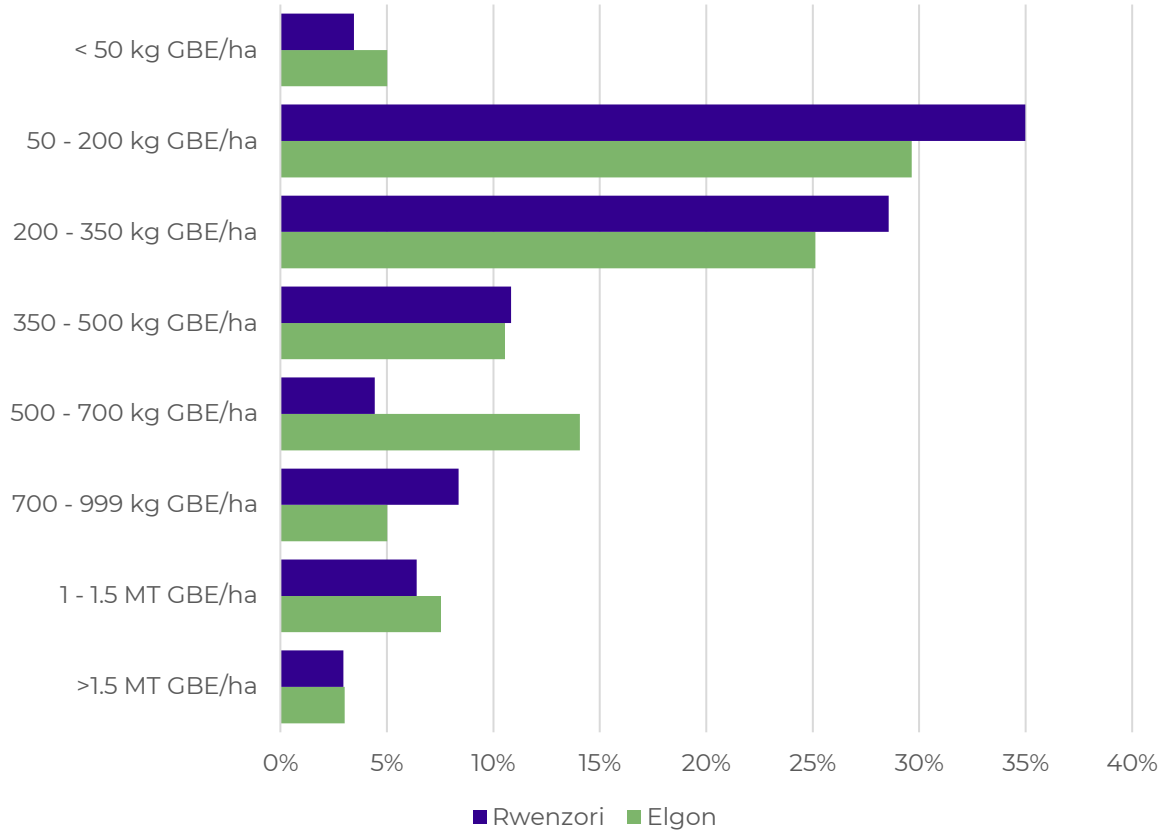
Distribution total household farm size

*What is the total size of the Arabica coffee farms?*




Distribution yield/ha KG GBE

*Calculated*

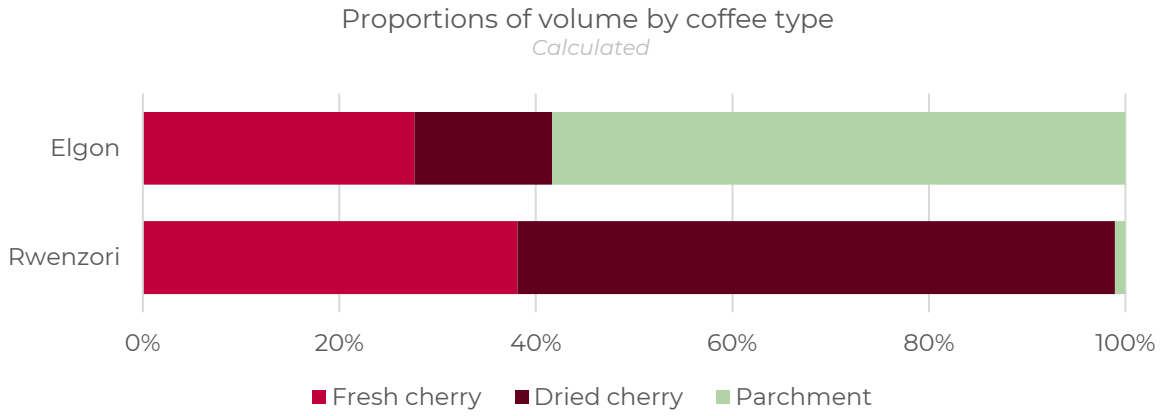


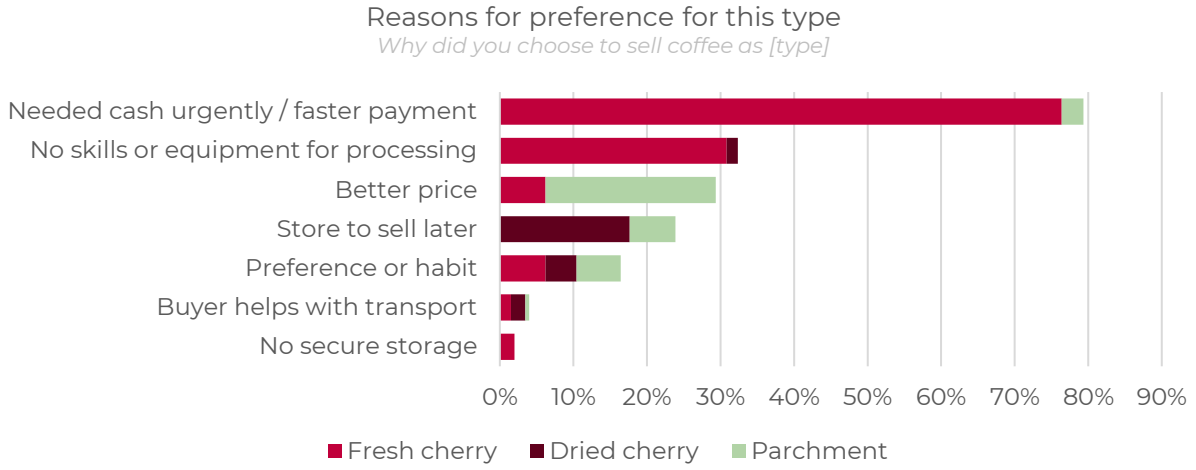

*Sources: sùúrù, Matrice360*

# Routes to market

## Combining different coffee types and routes to market allows households to optimize for quick cash flow and long term profit.

- Most farming households sell multiple coffee types. Farmers typically sell a portion of harvest as fresh cherry and dried cherry. In Elgon, parchment is becoming more common.
- Fresh cherry sales are primarily driven by cashflow needs and buyer access, some indicate they do not have equipment or knowledge for further processing.
- Dried cherry allows farmers to store their coffee and sell it at a later time, taking advantage of spreading cash flow and market prices developments.
- Parchment has a combined advantage of fetching a higher price, and option to store and sell at the preferred time after the season.



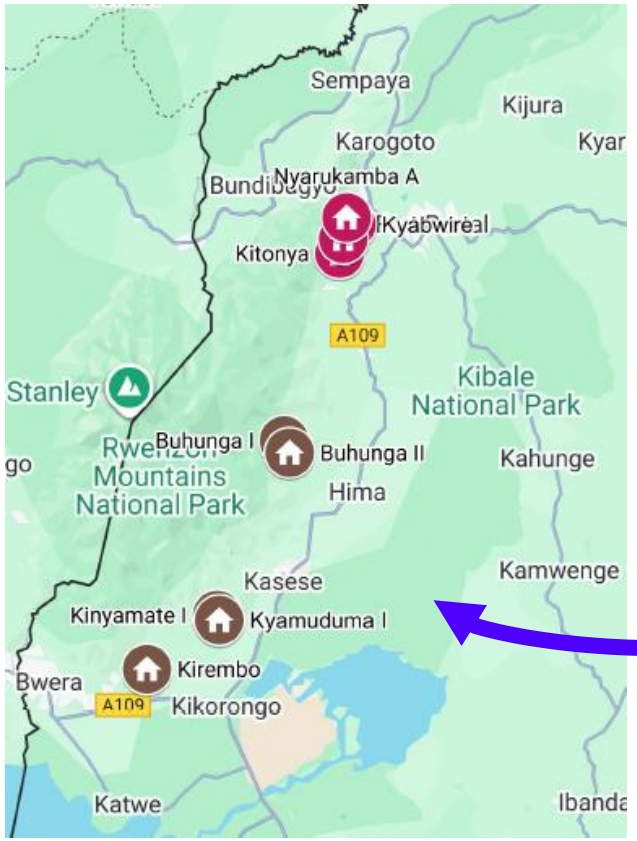



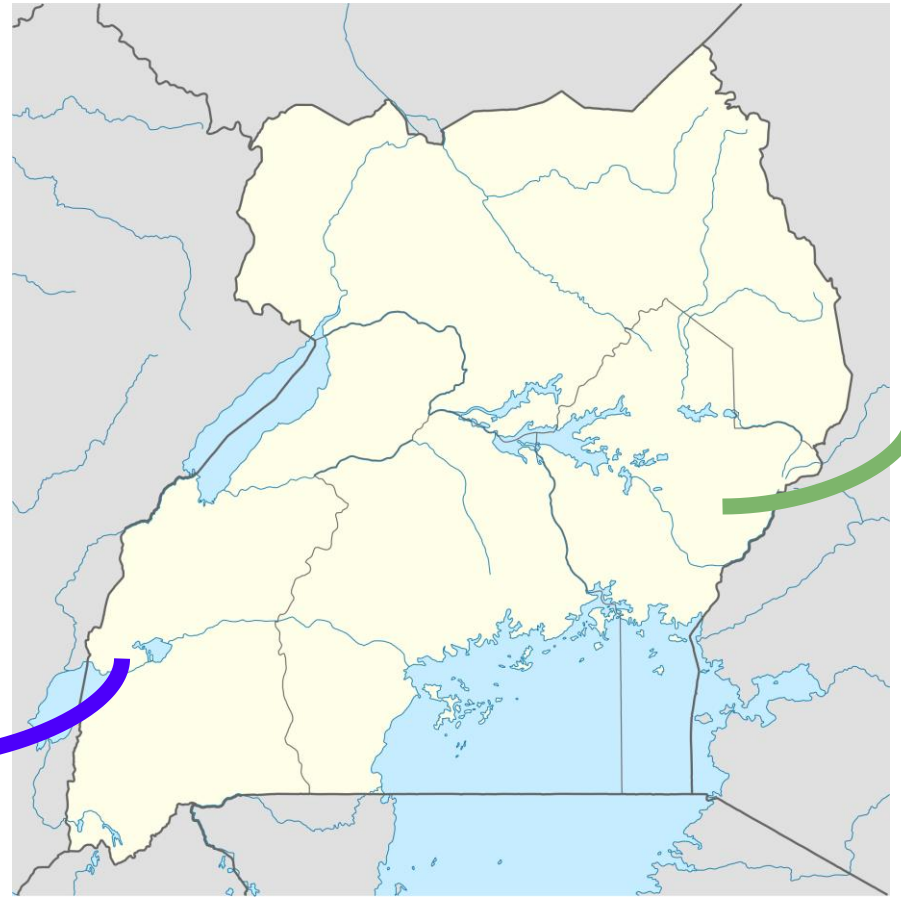

*Sources: sùúrù, Matrice360*

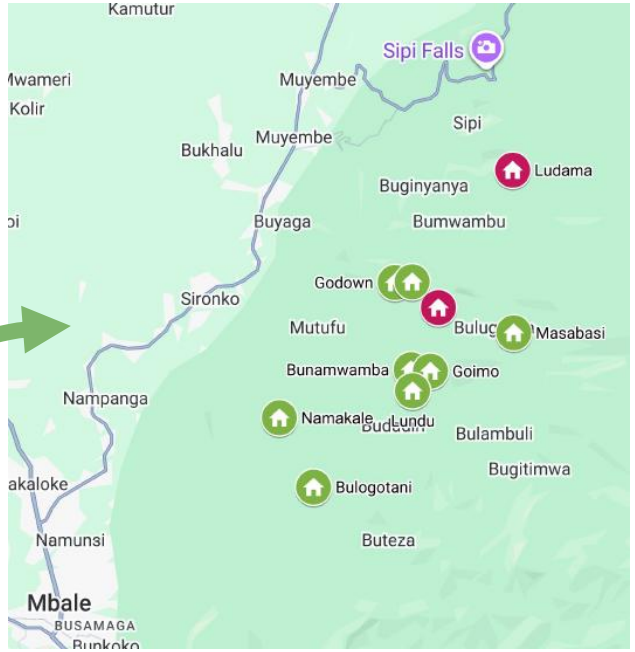
# Community segmentation by value chains

## There are large differences between villages within each region in the type of coffee sold, mostly depending on equipment and buyer availability.

**Rwenzori**






**Elgon**

Communities that primarily sell:
- fresh cherry
- dried cherry
- parchment

*Sources: sùúrù, Matrice360*

# Processing practices

## Limited pulper access drives processing delays, while basic drying infrastructure leaves farmers vulnerable to weather.

| | Elgon | Rwenzori |
|---|---|---|
| % of farmers that processes same day | 41% | (see note) |
| % using a mechanical pulper | 2% | (see note) |
| % using concrete washing channels | 1% | (see note) |
| % that pays to use a pulper | 83% | (see note) |
| Average days to dry (parchment) | 8.4 | (see note) |
| Average days to dry (dried cherry) | 12.3 | 16.2 |
| % drying on tarpaulin on ground | 94% | 87% |
| % drying direct on ground | 1% | 17% |

*Note: For pulping and washing Rwenzori has been excluded from analysis in this section, considering the sample of farming households that produce parchment there is too small.*

- When farmers do process their coffee, delays beyond recommended processing times are common.
- Manual and micro-washing practices are common across Elgon, with manual pulpers as default, and a range of household tools used for washing.
- Over half of farmers delay processing beyond the same day, primarily due to needing enough cherries for batch pulping (28%) or lack of pulper access (25%) - only 30% of Elgon farmers own a pulper.
- Drying is commonly on the ground or a tarpaulin. The majority of farmers experiences weather issues during drying, with moving coffee inside as only resort.

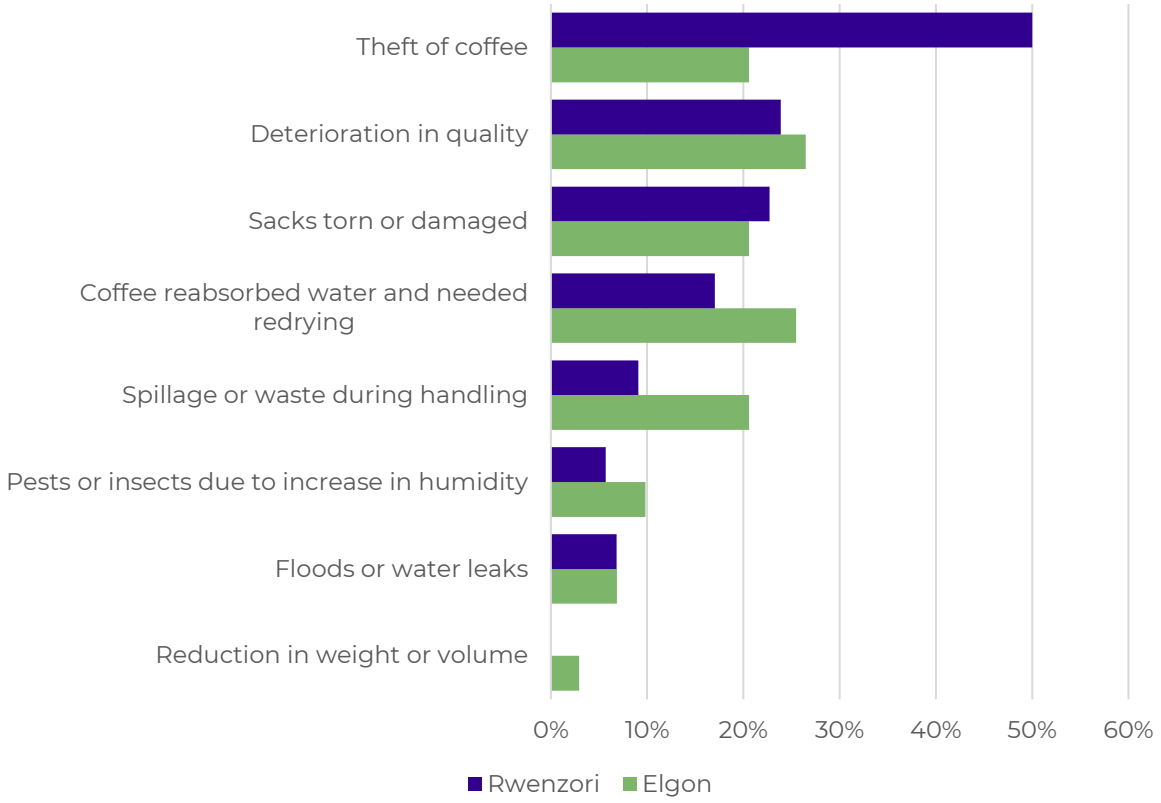
*Sources: sùúrù, Matrice360*

# Storage practices

## Storage is mostly within the house in sacks, and farmers report regular losses caused by insecurity as well as weather.

Incidents experienced during coffee storage

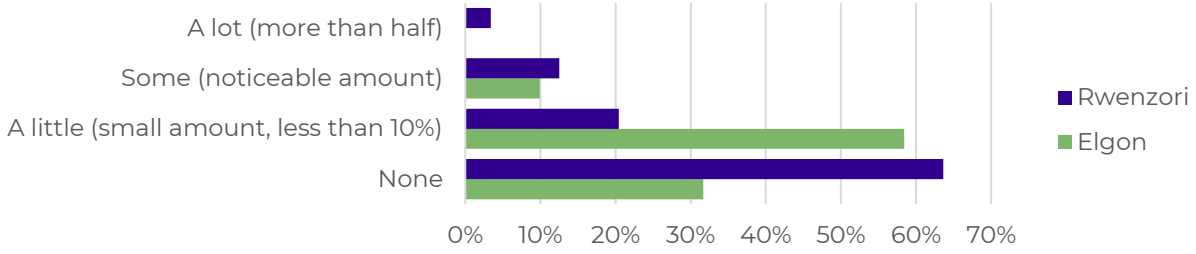
*Which of these incidents have you experienced in the last two seasons during coffee storage?*




- Elgon farmers store three times longer compared to Rwenzori (70 days vs 21 days) and face more climate-related losses.
- Half of Rwenzori farmers report theft as a storage incident, compared to 21% in Elgon, despite 91% of Elgon farmers and 72% of Rwenzori farmers considering their storage safe.
- Storage methods differ: 99% of Elgon farmers use sacks while 70% of Rwenzori farmers use plastic bags, and only 3% of households in Rwenzori has a dedicated storage room.

Losses during storage

*In the last two seasons, did you experience any losses of coffee during storage?*




*Sources: sùúrù, Matrice360*

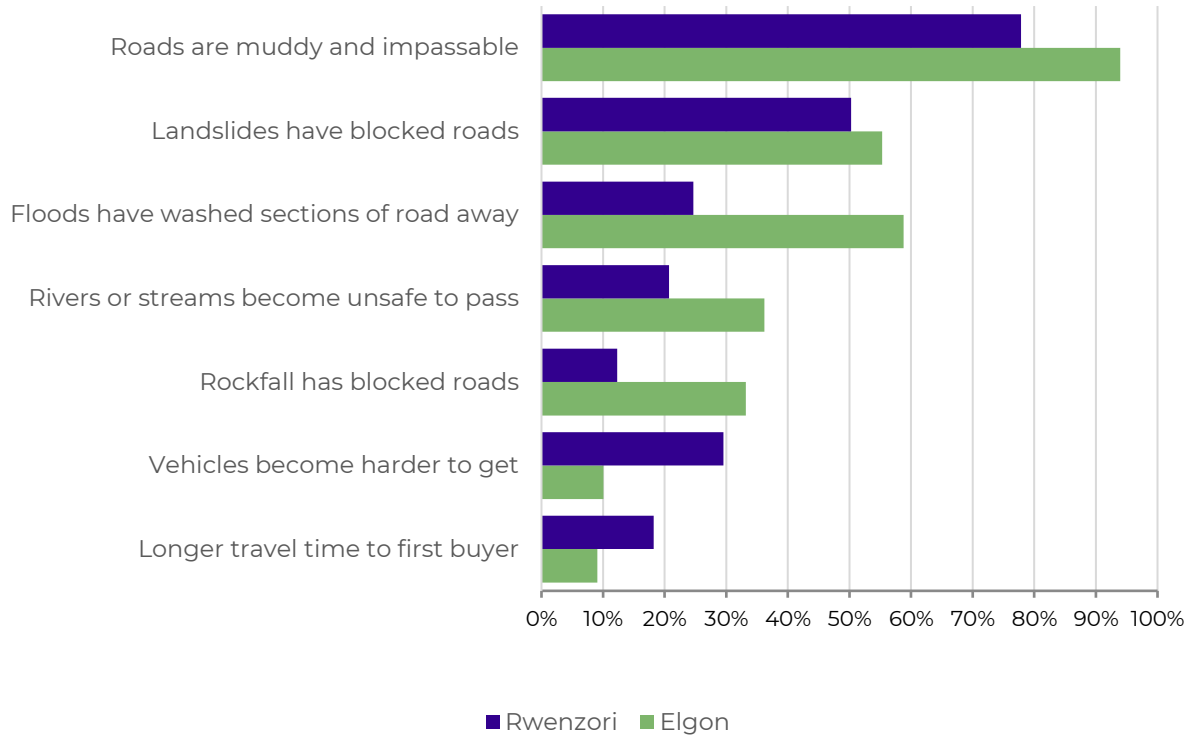
# Transport practices

## Transport losses and delays stem from poor road infrastructure: a systemic challenge requiring broader investment beyond the coffee sector.

- Farmers are responsible for transport in 30-50% of instances, with middlemen and cooperatives arranging transport for the remainder.
- Buyers are typically located <5km from the farm, and transport is most commonly by foot or on motorbike.
- Transport delays happen often in Rwenzori, and very often in Elgon. Perceptions about climate change trends vary widely between respondents and villages.
- Over half of farmers report vehicles breaking down or getting stuck at least once during harvest season, with 10% in Elgon experiencing breakdowns almost every week.
- Breakdowns and delays lead to coffee losses, and can also cause rejections or discounts by buyers if coffee quality is affected in discount.

Incidents during transport (count)

*Which of these incidents have you experienced in the last two seasons during coffee transport*

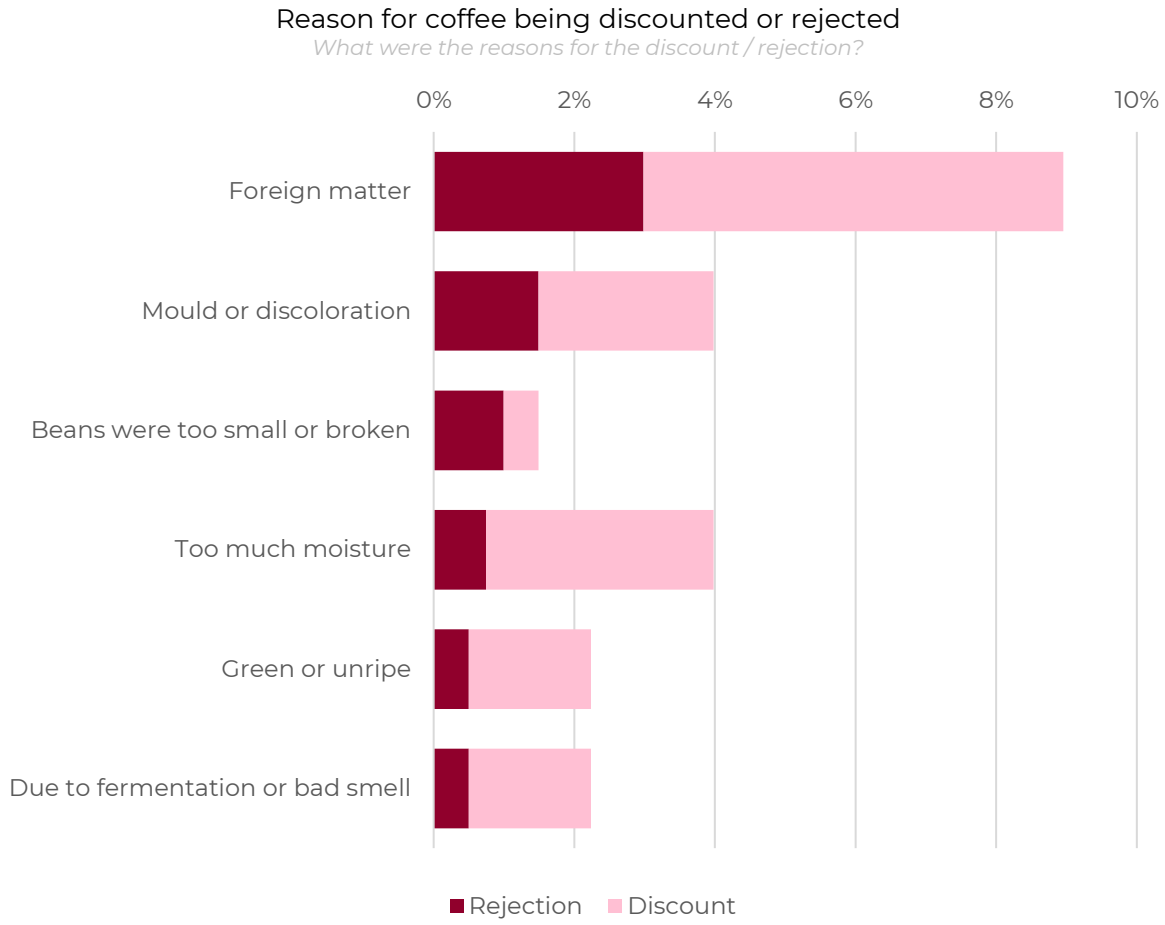



*Sources: sùúrù, Matrice360*

# Marketing and sales practices

## Farmers have buyer options but lack formal agreements; quality issues trigger discounts more than rejections

- A third of households always sells to the same buyer. This is more common in Elgon. Available options differ between villages.
- Farmers access to multiple buyers (3 on average), but only 9% have written contracts. Payment is mostly on the same day. 29% of households is a member of a cooperative. This is more common in Rwenzori compared to Elgon.
- Price discounts based on quality are reported by respondents, with average volume discounted reaching around one third; rejections are rarer (up to 10% of volume) and are concentrated in Elgon.
- 37% of households report getting an incentive from the buyer for good quality, often price and sometimes an end of season bonus or prefinance.



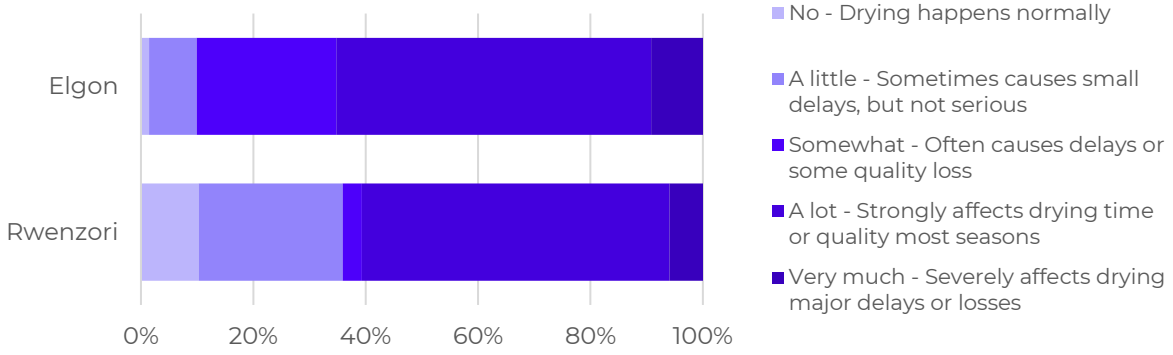

*Sources: sùúrù, Matrice360*

# Reported impact of climate

## Climate pressures are widespread, Elgon farmers are most strongly affected, especially for drying coffee, and report worsening trends over the past five years.

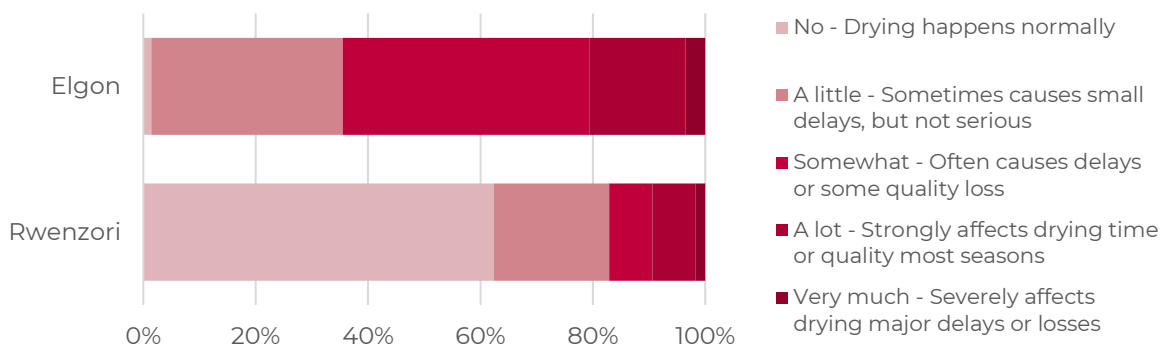
### Heavy rains affected drying

*In the 2025 fly crop and 2024 main crop, did you experience heavy rains that affected coffee drying?*



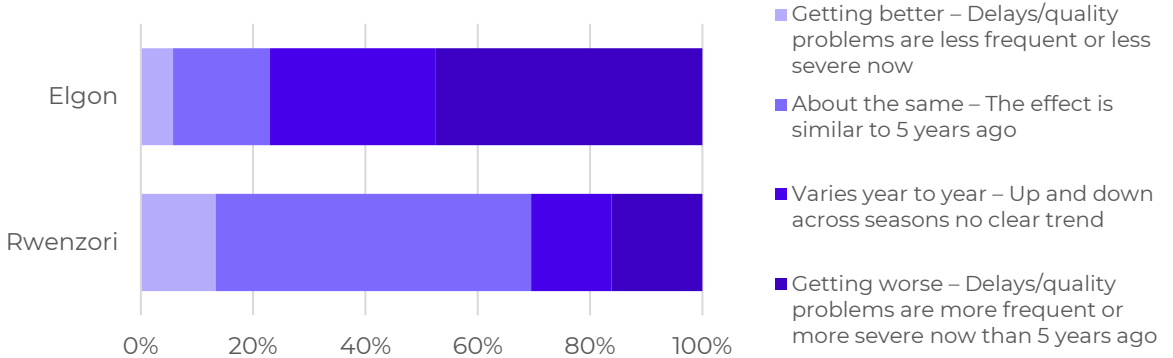

### Peak temperatures affected drying

*In the 2025 fly crop and 2024 main crop, did you experience peak temperatures that affected coffee drying?*




### Change in impact of heavy rains over five years

*Over the last 5 years, has the impact of rain on coffee drying gotten worse, better, or stayed about the same?*

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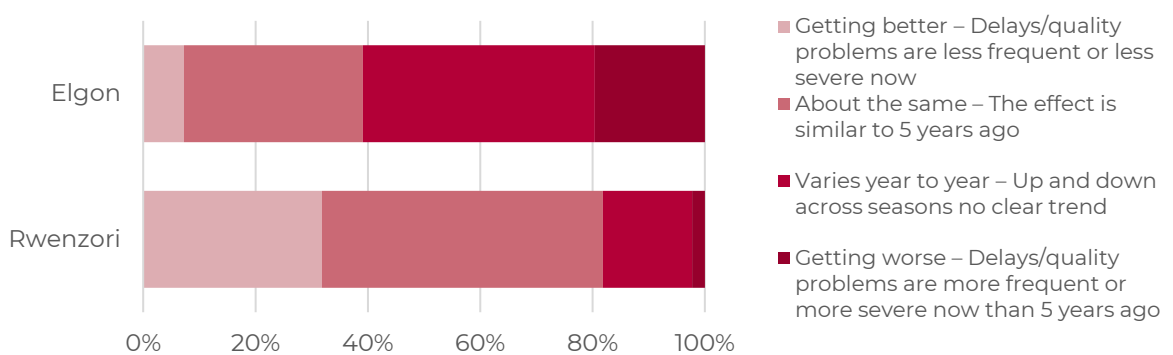
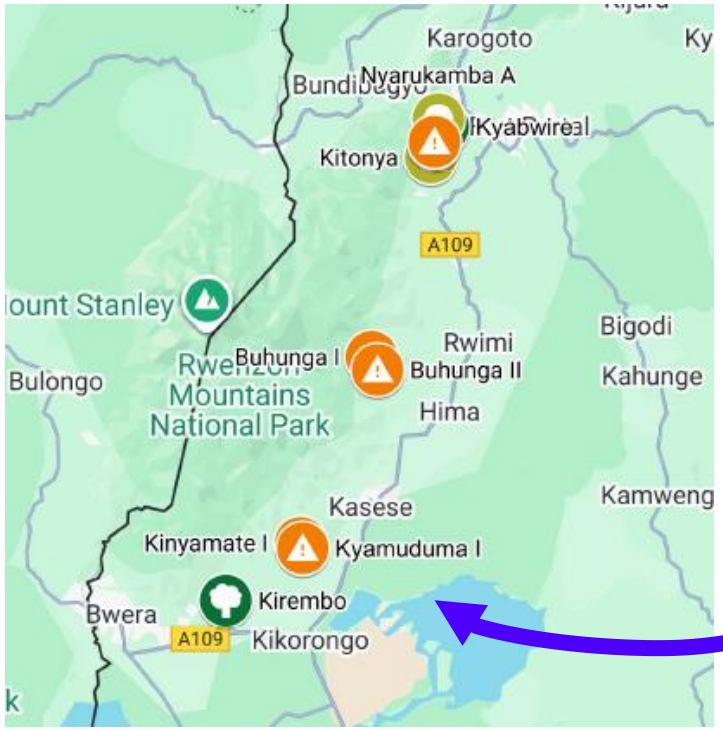


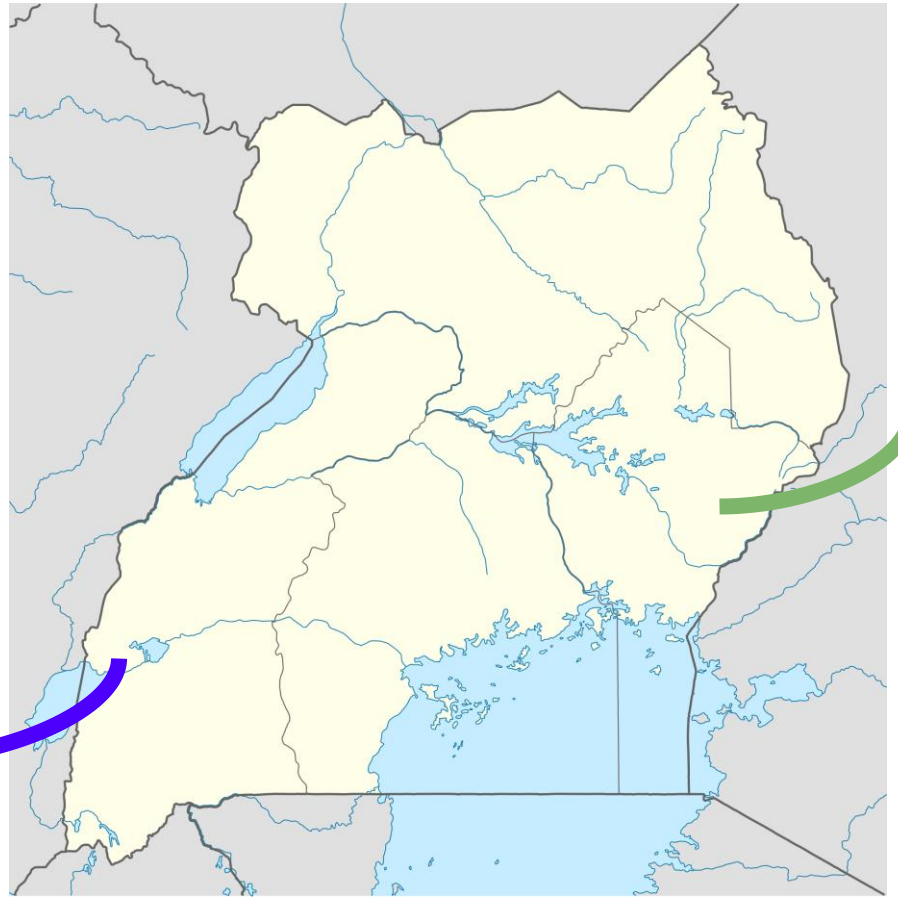

*Sources: sùúrù, Matrice360*

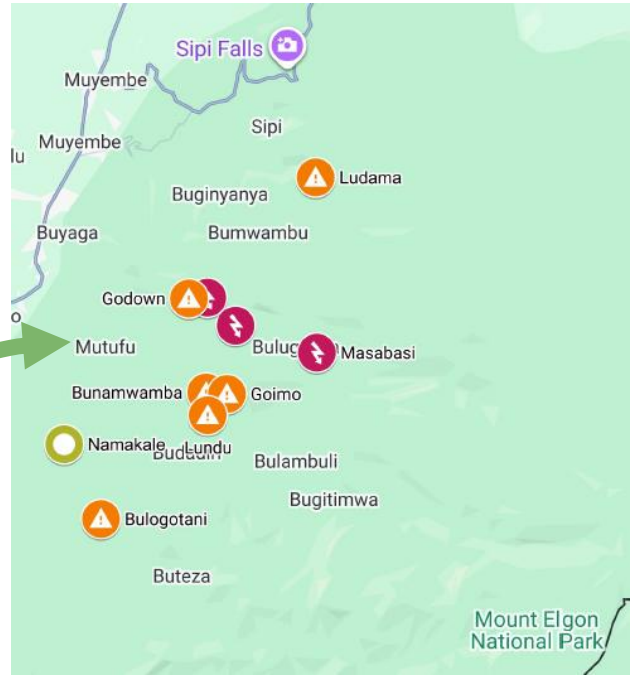
# Community segmentation by climate impact

## The communities most heavily affected by weather during drying, storage and transport are all located in Elgon, yet impact still varies between communities.

**Rwenzori**






**Elgon**

Communities by external climate impact:

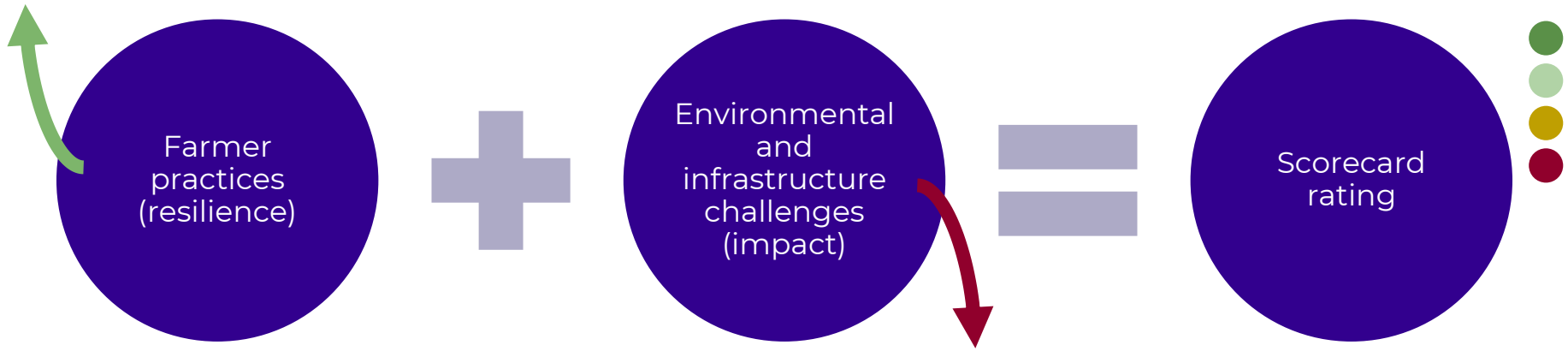
- very heavily affected
- heavily affected
- moderately affected
- little affected

*Sources: sùúrù, Matrice360*

# Farmer scorecard introduction

## Each of the surveyed farmers received an individual score to assess the resilience of their coffee processing practices and the external challenges they face.

- Practices within farmers' control
  - Processing (harvest-to-pulping time, washing methods)
  - Drying (method, duration, rain protection)
  - Storage (location, containers, protection)




- Environmental and infrastructure factors
  - Climate impact on drying (rain, temperature)
  - Transport and road conditions

**Scoring approach:**

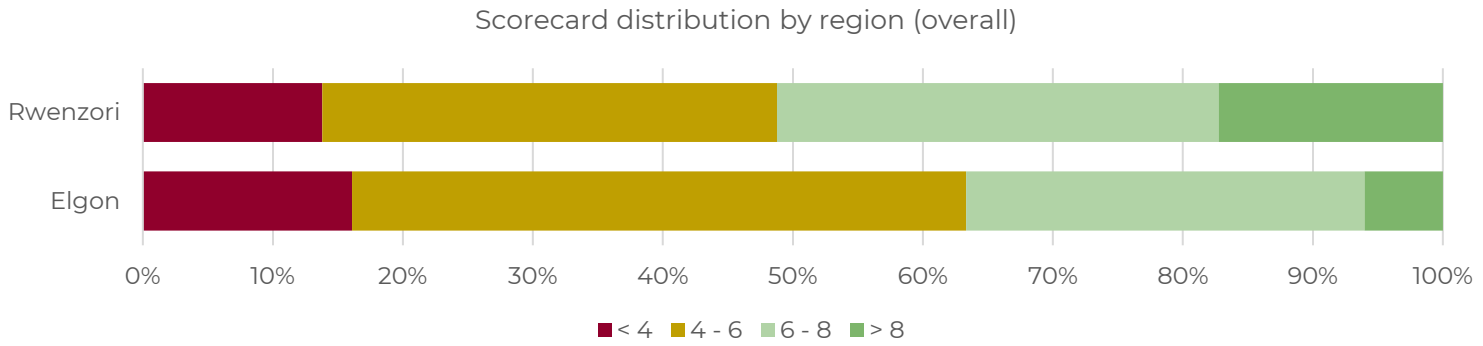
- Each dimension is a combined rating of the most relevant survey responses
- Each dimension is scored 1-10 based on survey responses
- Ideal practices score 10; points are deducted for suboptimal practices or responses
- Farmers are then segmented into four quadrants based on their combined scores

# Farmer performance segmentation

## Farming households vary widely in their resilience, and to what extent they experience negative external impact. Segmentation is key to roadmap design.

| Resilience | Elgon | Rwenzori |
|---|---|---|
| Drying practices | 6.7 | 6.4 |
| Processing practices | 5.8 | 7.0 |
| Storage | 6.3 | 3.5 |
| **Total average score for farmer practices** | **6.3 (out of 10)** | **5.3 (out of 10)** |

| External impact | Elgon | Rwenzori |
|---|---|---|
| Climate affecting processing | 4.9 | 6.4 |
| Climate and roads affecting transport | 4.6 | 5.9 |
| **Total average score for external impact** | **4.7 (out of 10)** | **6.2 (out of 10)** |



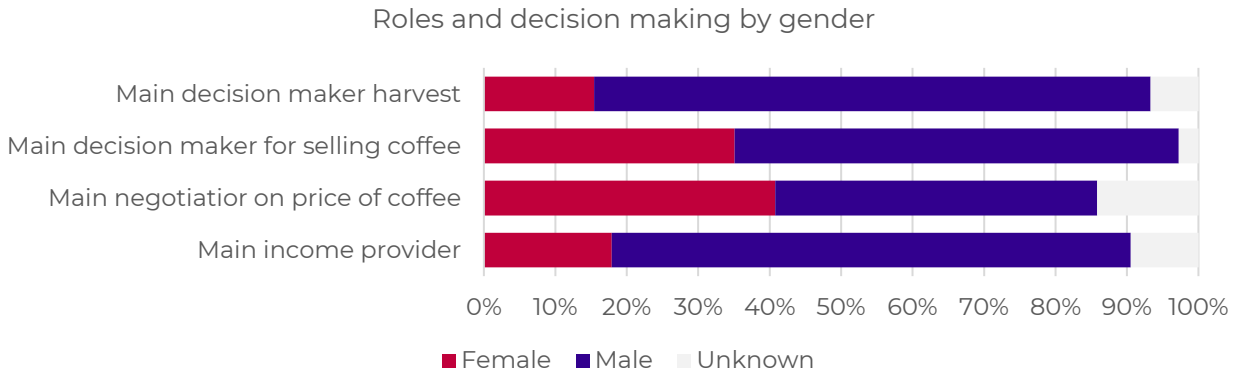

- Farmers can be segmented by their resilience (good farmer practices for drying, processing and storage) and their negative external impact (climate and infrastructure).
- Farmers in Elgon typically apply better drying storage and logistics practices that improve resilience. In Rwenzori, storage is a major resilience challenge.
- Farmers in Elgon are however much more affected by negative external impact from weather, climate change and infrastructure, compared to farmers in Rwenzori.

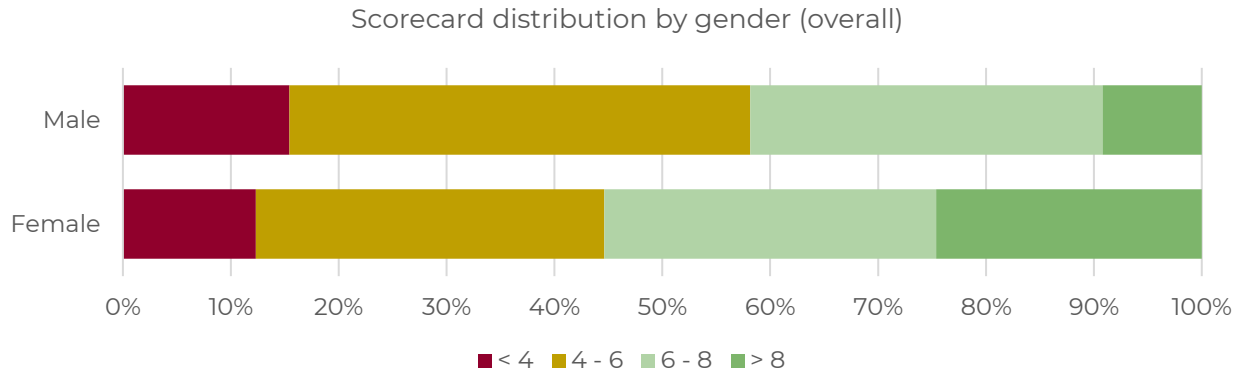
*Sources: sùúrù, Matrice360*

# Gender characteristics

## Women face structural barriers in land and education, yet female-headed households outperform on resilience scorecards.

- Female heads of household typically have lower education and smaller farms in both regions Elgon and Rwenzori.
- In up to 80% of the households, the person in charge of decision-making about harvest, processing and sales is a man. Women have relatively more agency in price negotiation (41%) than in harvest decisions (15%).
- 25% of female-headed households score above 8 on the quality scorecard compared to 9% of male-headed households. This means that female-headed households are more likely to have implemented climate-resilient processing and storage practices.



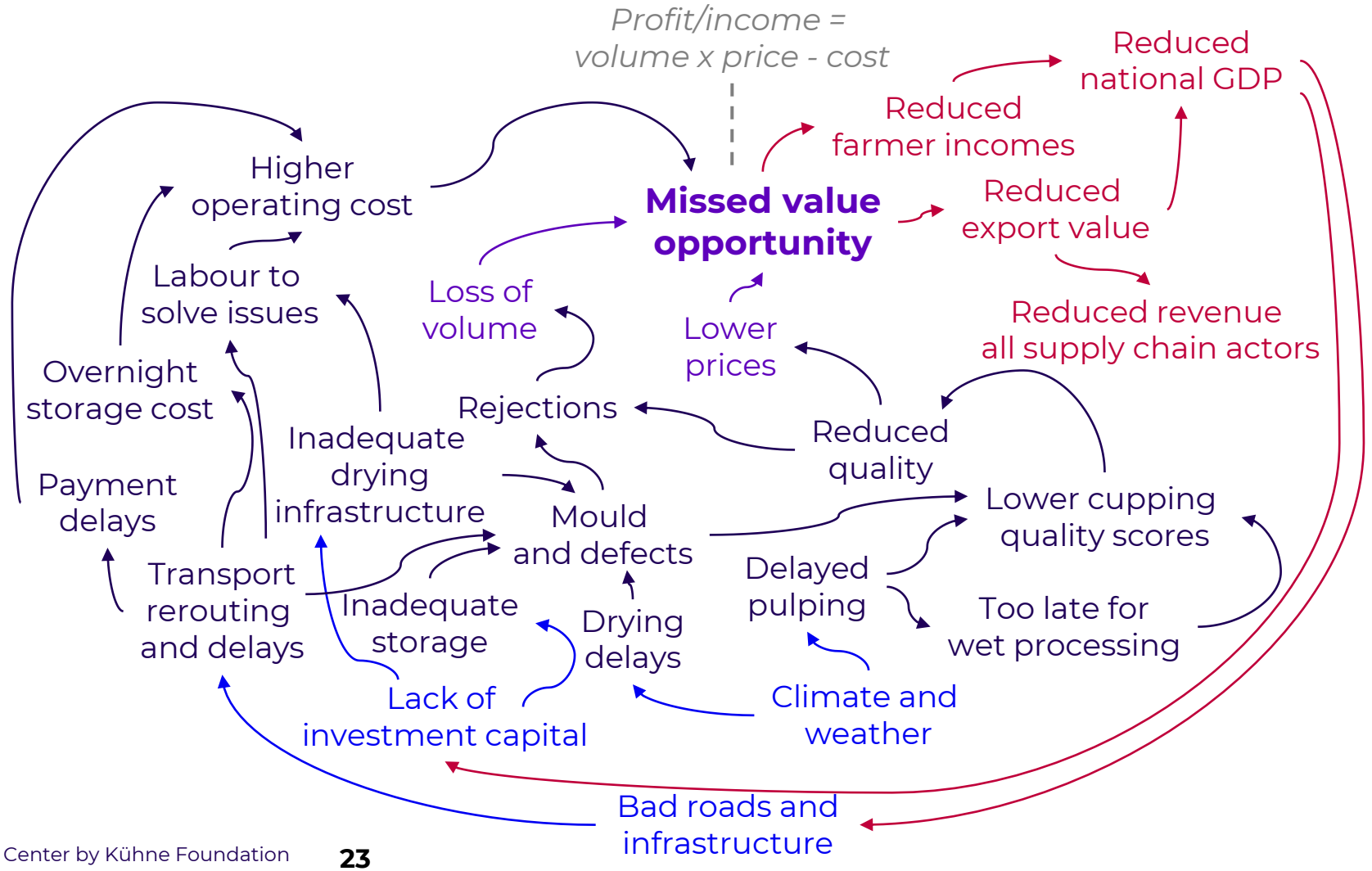

*Sources: sùúrù, Matrice360*

# first mile losses

Arabica coffee in Uganda

# First mile opportunity

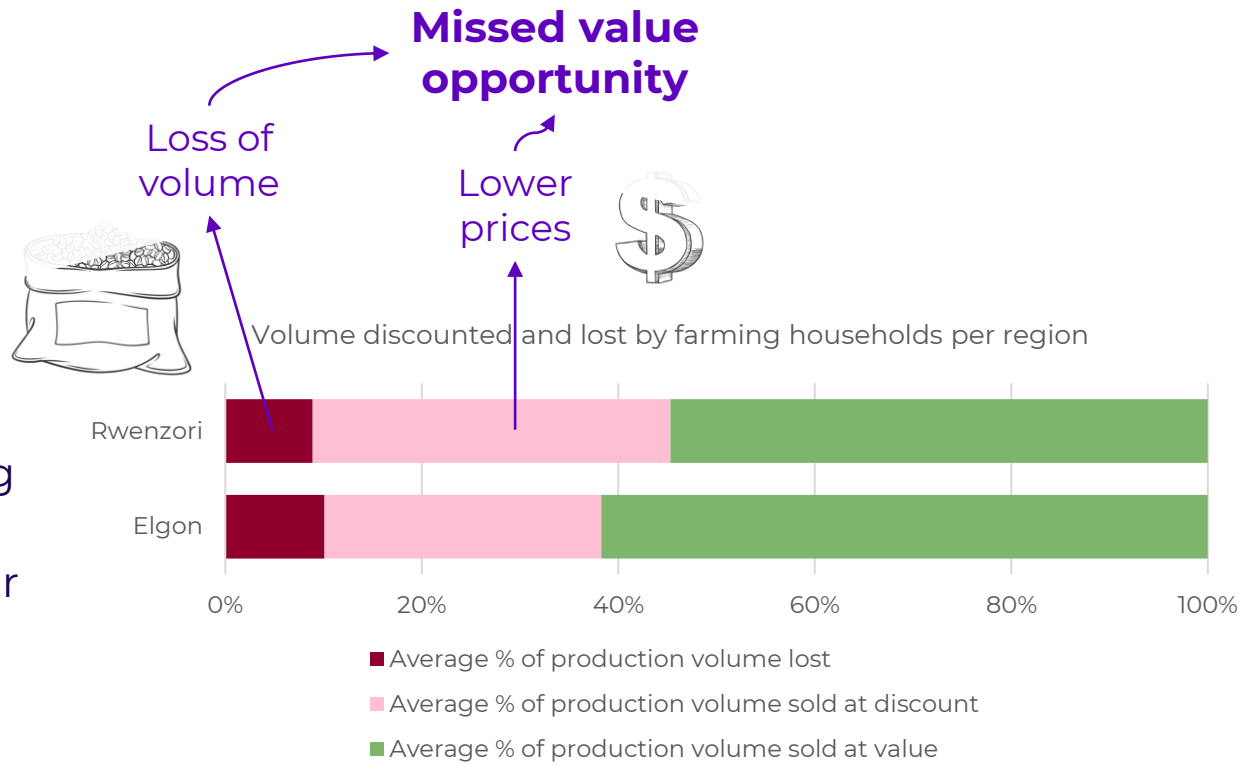
**First mile challenges cause a missed value opportunity. Additional value can be captured by farmers and supply chain actors by reducing losses and price discounts.**



# First mile volume and value losses

## The loss of value can be driven by volume (physical losses) and by lower prices (quality losses). Nearly half of the sector is affected by one or both types of loss.

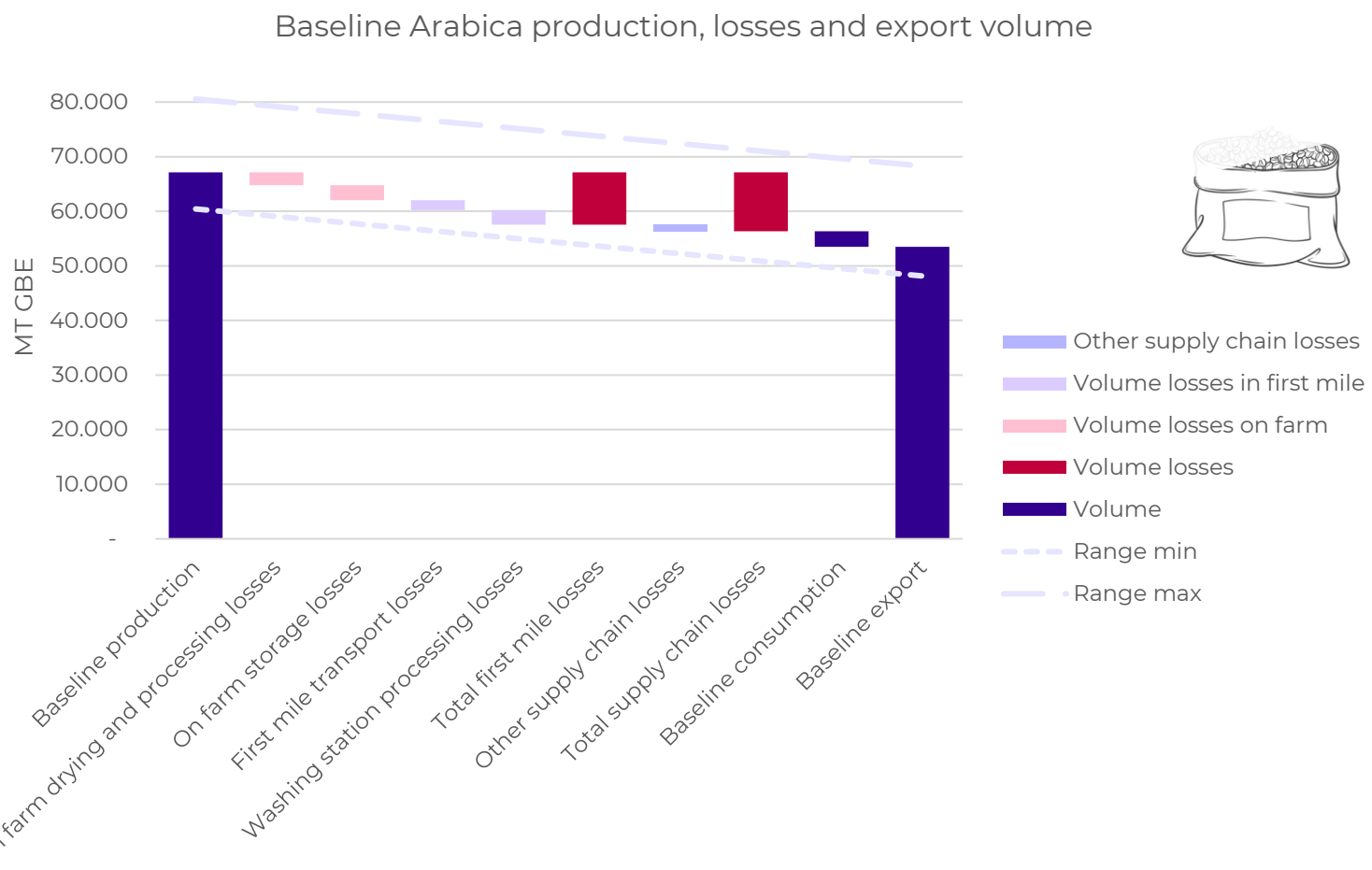
- Based on a farmer survey in key Arabica regions, losses and discounts experienced by farming households for each post-harvest stage were calculated. These losses have been extrapolated to the farmer population.
- Volume losses are coffee that is lost in storage or transport, or coffee that is rejected by the market because quality is below the cut off point. Volume losses directly affecting farmers are calculated at ~10% of coffee production volumes. An additional ~4% of volume losses occurs for other first mile actors.
- In addition to volume losses, farming households sell almost one third of Arabica coffee to the market at a discount, with quality lost in processing and logistics.
- Bottom-up and top-down estimates provide similar figures for coffee losses in the supply chain. Proportions of coffee discounted align with expert estimates.




*Source: sùúrù*

# Supply chain volume losses

## 14% of Arabica coffee volume is lost in the first mile of the supply chain, three quarters of this loss directly affect farming household incomes.



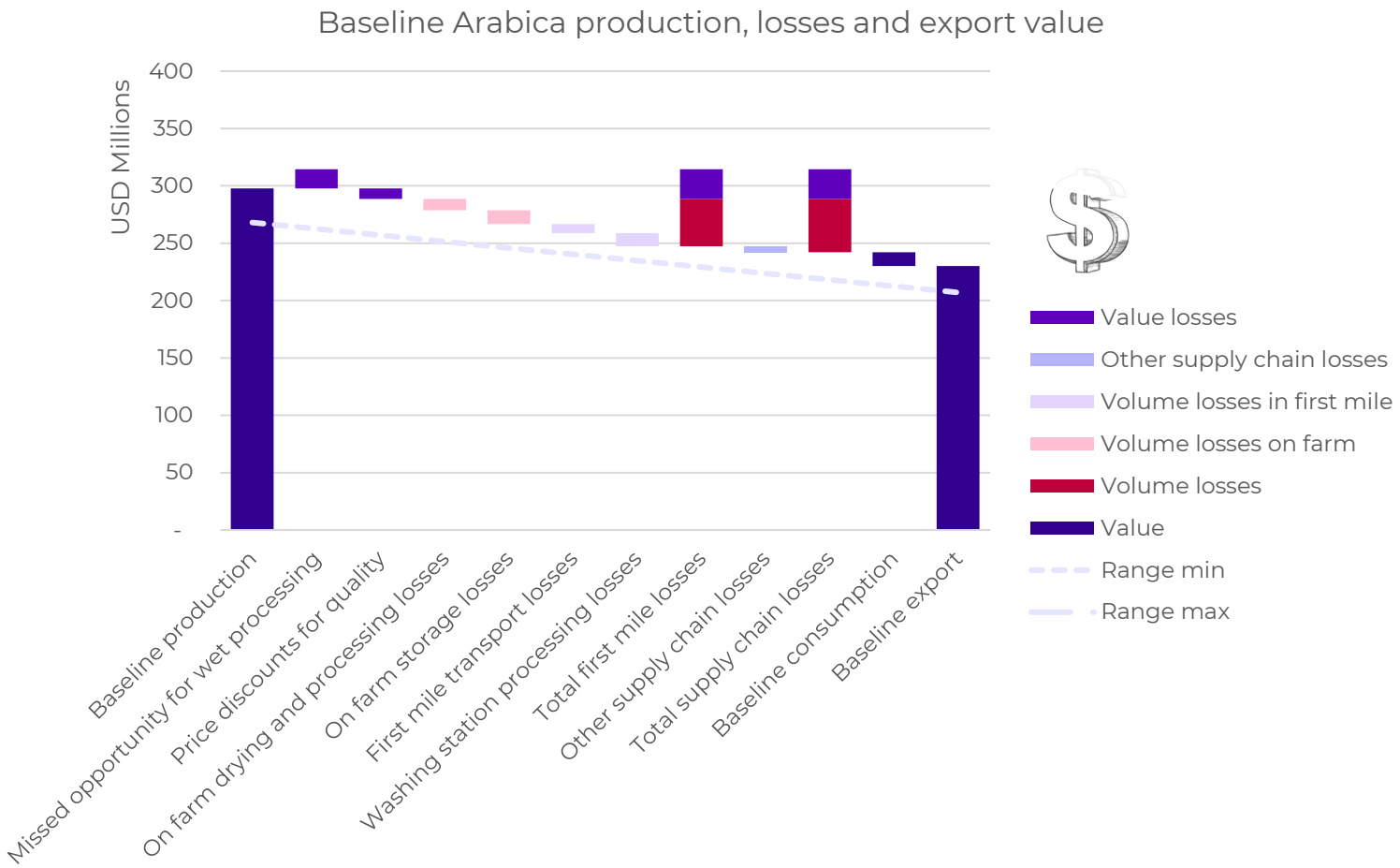



- Combining bottom-up and top-down estimates for coffee losses in the supply chain, first mile supply chain volume losses add up to ~10,000MT of Arabica coffee annually.
- This loss of coffee volume has a value of ~$40 million in the first mile, of which ~$30 million directly affects farming household incomes.
- Farmers experience losses during on farm processing and storage, as well as in transport.
- Other supply chain actors lose a portion of volume at their washing stations and throughout the supply chain.

*Source: sùúrù*

# Supply chain value losses

## In addition to physical volume losses, there is a missed value of ~$25 million, from coffee that is not fully processed, or from quality discounts applied by the market.

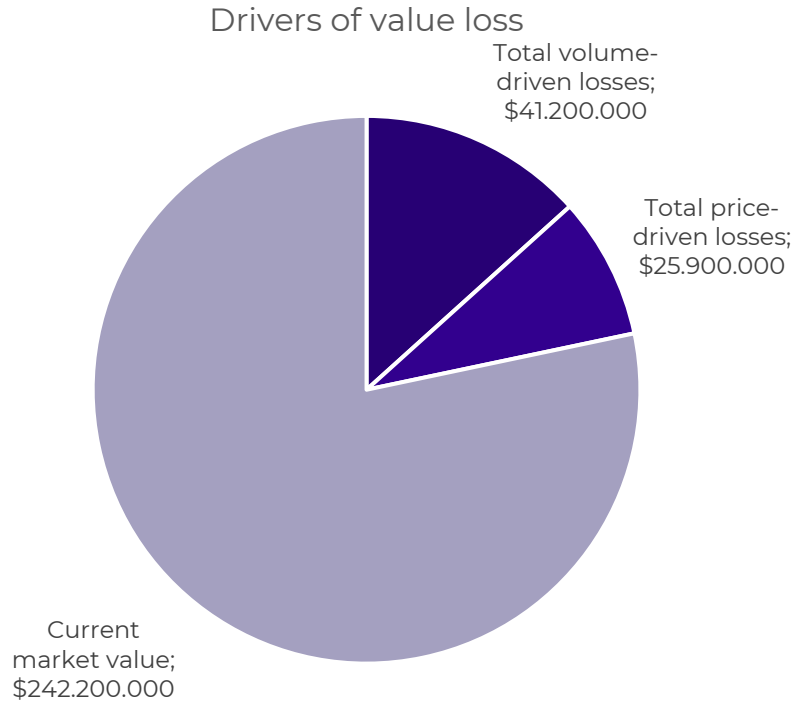


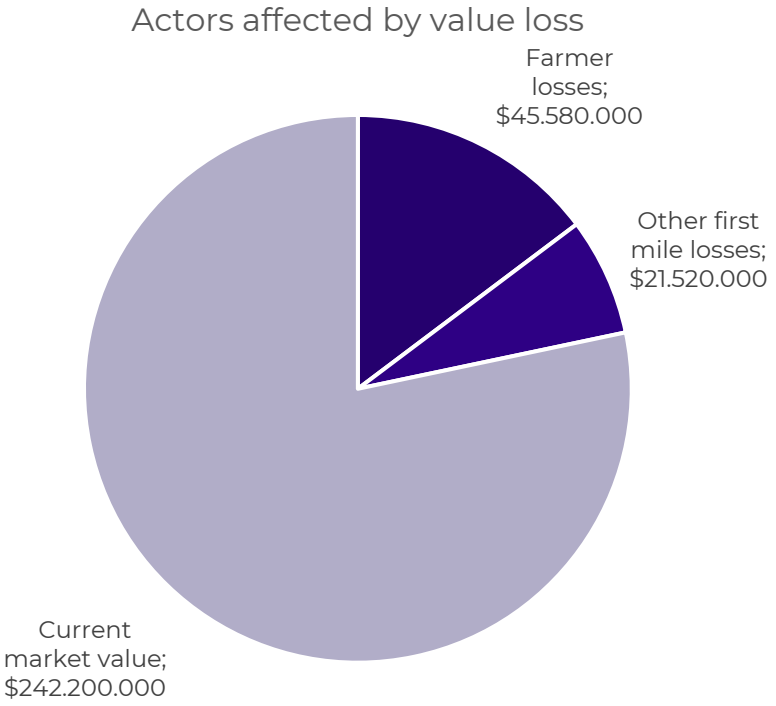

- In addition to volume losses, almost one third of Arabica coffee is sold to the market at a discount, with quality lost in processing and logistics.
- One third of coffee is currently dry processed, missing out on a market premium for wet processed coffee.
- While physical volumes losses are valued at $40 million in the first mile, losses from lower prices represent another $25 million value opportunity.
- The value of the opportunity combines historical price data using a multi-year average price, with expert estimates for discounts and premiums. Market price volatility needs to be monitored.

*Source: sùúrù*

# First mile opportunity

## The Uganda sector misses out on ~$67 million annually in supply chain losses from lost volume and lower prices, two thirds affects farming households directly.




**Uganda coffee sector misses out on $67 million** due to preventable losses in first mile logistics

The missed opportunity is a combination of physical losses (volume), and the loss of quality (price). This was recently quantified by the Kuehne Climate Center in a study.

The value consists of volumes losses, as well as lower prices caused by reduced coffee quality. Climate change has increased the challenges in recent years. Two thirds of the loss is directly affecting farmer incomes.

Fortunately, solutions are available, and with a one-off investment of $17 million, combining public support with commercial investments, the sector can capture $8 million of this missed opportunity annually.

*Source: sùúrù*

# intervention opportunities

Arabica coffee in Uganda

# Intervention opportunities

## Relatively simple interventions in 1st mile logistics can be used to reduce volume losses and increase prices by maintaining or improving quality.

- Relatively simple interventions in 1st mile logistics can be used to reduce volume losses and increase prices by maintaining or improving quality. The largest value losses occur in the first mile and directly affect farmers. These have been prioritized in exploring interventions.
- Value can be created in several ways: (1) reducing physical losses, (2) reducing rejections, (3) reducing price discounts, and (4) increasing the coffee value by upgrading to washed coffee.
- Interventions are focussed on value chain solutions that can be implemented in partnership between farmers, supply chain actors and civil society.
- For each intervention, the initial investment as well as operating cost has been considered, and compared to the volume and value of the coffee output. This generates an estimate of additional income that can be generated through prevention of coffee losses, and forms the foundation of the business case for investment.
- For some interventions, for example for better practices in coffee drying, there are different options that could be applied depending on each community or household's needs and context. This would need to be considered in an implementation plan.
- In addition to losses from post-harvest and primary processing, transport losses also occur. These are mostly driven by lack of appropriate infrastructure. While road repairs can generate significant value, this is not in scope of private sector solutions.

# Drying

## Appropriate drying infrastructure protects the crop from weather and external influences during the process, and maintains the appropriate temperature.

**Drying table with canopy:** simple raised drying structure that includes a wooden frame, mesh or hessian drying surface, and a removable canopy made from local materials


**Collapsible dryer:** Collapsible frame with inflatable walls, transparent UV-resistant plastic cover, and drying rack surface.

**Solar dryer:** covered drying that includes a timber or metal frame, UV-stabilised plastic sheeting or polycarbonate roofing, raised mesh drying beds, and adjustable ventilation panels.

*Sources: sùúrù, Perfect daily grind, Grainpro, Jiji,*

# Drying interventions

## Better drying practices can significantly reduce rejections and price deductions. Different interventions can prioritize ROI, total investment need, or farmer impact.

| | Drying table with canopy | Collapsible dryer | Solar dryer |
|---|---|---|---|
| Capacity per unit per year | 5.1 MT GBE | 5.1 MT GBE | 14.4 MT GBE |
| Beneficiaries per unit | 20 farmers | 20 farmers | 60 farmers |
| Investment + TA cost per unit | $ 150 one-off | $ 400 one-off | $ 3,300 one-off |
| Operating + maintenance cost | $ 5 monthly | *lowest operating cost* Nil | $ 10 monthly |
| Return on investment | *highest ROI* 290% ROI | 149% ROI | 163% ROI |
| Net present value | $ 307 positive NPV | $ 462 positive NPV | $ 3,590 positive NPV |
| Recommendation | yes, 3,230 units | yes, 2,870 units | yes, 2,050 units |
| Total investment | *lowest investment* $ 0.5 million one-off | $ 1.1 million one-off | $ 6.8 million one-off |
| Total added coffee income | $ 0.4 million annually | $ 1.0 million annually | $ 3.6 million annually |
| Break even term | 1.3 years | 1.2 years | 1.9 years |
| Total farmer beneficiaries | 64,600 farmers | 57,400 farmers | 123,000 farmers |
| Additional income for farmers | 0.9% increase | 2.4% increase | *best value impact* 4.2% increase |
| Rationale | Better drying practices can significantly reduce rejections and price deductions, drying tables with canopy are close to current practices and easier to implement. | Better drying practices can significantly reduce rejections and price deductions, collapsible dryer has lower investment and annual cost compared to alternatives. | Better drying practices can significantly reduce rejections and price deductions, solar dryers are especially important for regions heavily affected by weather. |

# Pulping and washing

## A mechanical pulper could improve quality of processing in currently manual wet processing. Micro or concrete washing stations can increase rates of wet processing.

**Mechanical pulper:** engine-driven machine that includes a hopper, rotating disc or drum with a breast plate, and a chute or channel

**Manual pulper + micro station:** small-scale wet processing unit that includes pulper, fermentation tank, washing/grading channel, raised drying tables, basic water supply with drainage

**Station with concrete channels:** medium-scale wet processing facility that includes fermentation tanks, concrete washing & grading channels, raised drying tables, water storage, and wastewater treatment.

*Sources: sùúrù, Alibaba, XII Coffee, Ozone Coffee*

# Pulping and washing interventions

## While increasing the use of wet processing can add a price premium to the existing sector value, it is heavily impacted by market volatility and with low or negative ROI.

| | Mechanical pulper | Micro washing station | Concrete washing station |
|---|---|---|---|
| Capacity per unit per year | 86.4 MT GBE | 3.6 MT GBE | 117 MT GBE |
| Beneficiaries per unit | 280 farmers | 10 farmers | 530 farmers |
| Investment + TA cost per unit | $ 2,800 one-off | $ 2,100 one-off | *capital intensive* $ 70,000 one-off |
| Operating + maintenance cost | $ 25 monthly | $ 100 monthly | $ 5,000 monthly |
| Return on investment | *negative ROI* -17% ROI | *negative ROI* -27% ROI | 142% ROI |
| Net present value | -$ 781 negative NPV | -$ 639 negative NPV | $ 40,663 positive NPV |
| Recommendation | no | no | optional, 40 units |
| Total investment | | | $ 2.8 million one-off |
| Total added coffee income | | | $ 0.7 million annually |
| Break even term | | | 4.1 years |
| Total farmer beneficiaries | | | 21,200 farmers |
| Additional income for farmers | | | *best value impact* 4.7% increase |
| Rationale | High operating cost and limited impact on reduction of rejections and discounts compared to current manual practices results in negative ROI for this intervention. | Low capacity per unit, limited impact on price premium captured, and significant need to invest in TA results in negative ROI for this intervention. | ROI is positive, but returns are moderate and operation is capital intensive, additional value created would possibly reach the operator instead of the farmer. |

# Storage

## A community store can improve weather protection and security during storage. Innovations in storage bags can maintain quality for extended periods of time.

**Community store:** A shared storage facility that includes a concrete floor, brick or block walls with ventilation, lockable doors, metal roofing, wooden.


**PICS bags:** Hermetic triple-layer storage bags that includes two inner high-density polyethylene liners and an outer woven polypropylene sack, typically holding 50-100kg.

*Sources: sùúrù, Serious Eats, PICS*

# Storage interventions

## A shared community store replacing home storage can reduce losses caused by weather and insecurity, and can be combined with PICS bags to preserve quality.

| | Community store | PICS bags |
|---|---|---|
| Capacity per unit per year | 97.3 MT GBE | 0.3 MT GBE |
| Beneficiaries per unit | 240 farmers | 2 bags per farmer |
| Investment + TA cost per unit | $ 10,150 one-off | $ 2 one-off |
| Operating + maintenance cost | $ 100 monthly | Nil |
| Return on investment | 320% ROI | 1008% ROI |
| Net present value | $ 16,960 positive NPV | $ 22 positive NPV |
| Recommendation | yes, 560 units | yes, 33,960 units |
| Total investment | $ 5.7 million one-off | $ 0.1 million one-off |
| Total added coffee income | $ 2.4 million annually | $ 0.3 million annually |
| Break even term | 2.4 years | 0.3 years |
| Total farmer beneficiaries | 134,400 farmers | 32,228 farmers |
| Additional income for farmers | 2.6% increase | 1.5% increase |
| Rationale | Storage losses are currently significant, and a shared community store replacing home storage can reduce losses caused by weather as well as insecurity. | Relatively low investment need and fast impact. Using better quality bags for storage can reduce losses especially for farmers currently using plastic bags. |

# Summary of recommendations

## We recommend a focus on drying and storage interventions. These are the primary drivers of losses, and solutions are easy to implement and maintain.

| Cluster | Intervention | Break even (years) | Recommendation | Recommended % of addressable market | Total investment | Total annual value | Rationale |
|---|---|---|---|---|---|---|---|
| drying | solar dryer | 1.9 | yes | 40% | $6.8m | $3.6m | Resilience can be achieved using better drying infrastructure. Different solutions apply depending on the farmer's location and capacity. Solar dryers are most relevant to areas with heavy rains where parchment is produced. |
| drying | collapsible dryer | 1.2 | yes | 20% | $1.1m | $1.0m | |
| drying | drying table with canopy | 1.3 | yes | 20% | $0.5m | $0.4m | |
| washing | mechanical pulper | no | no | 0% | | | Washing stations need scale to be viable. There is a business case for introducing more washed coffee, however this may be a better fit for a commercial aggregator. Small washing stations could have farmer impact if grant-funded. |
| washing | micro station with manual pulper | no | no | 0% | | | |
| washing | concrete washing station | 4.1 | optional | 20% | $2.8m | $0.7m | |
| storage | community store | 2.4 | yes | 50% | $5.6m | $2.3m | Better storage can reduce losses from climate as well as insecurity. Community stores can be combined with improved bags in highly humid areas. |
| storage | PICS bags | 0.3 | yes | 80% | $0.1m | $0.3m | |
| | | **2.0** | | | **$16.9m / one-off** | **$8.3m / year** | |

# Impact of recommended interventions

## With a ~$17 million investment and a 2 years break even term, a 3.4% sustainable increase in sector value can be realized.

- With a total investment of ~$17 million, an annual additional value of ~$8.3 million can be captured, resulting in a 2 years break even term.
- The potential income increase for farming households is ~2-4% for storage interventions, and for drying interventions ranges from ~1-5%.
- 245,000 farmers could benefit from improved drying facilities, 160,000 farmers could benefit from improved storage, with potential overlap between farming communities that could benefit from both.
- This investment addresses 12% of the total missed value opportunity. Once successful, additional scaling could be considered.
- No replacement investments have been considered at the end of the economic life of the assets. Drying and storage assets could also have value for other crops outside the coffee season, this value has also not been considered.

# Considerations

## Recommendations for interventions are based on economic viability and should be considered in context.

- In this assignment, we assessed return on investment based on the economic value, assessing whether the additional value that can be captured as revenue for the sector or farmers, covers the investment and operating cost. All recommended interventions have a projected break even time that is within the economic life of the assets.
- Some of the interventions that were included in the recommendations, notably micro washing stations, could still be considered under a less commercial partnership. These do not have a positive return on investment, but could still benefit farmers significantly if the assets or technical assistance could be subsidized or grant funded.
- Professional mechanized washing stations with concrete washing channels do have a business case on a sector level, but the investment amount may not be a fit with the Kuehne Climate Center, and depending on the ownership structure, the additional value is likely to benefit the operator of the washing stations more than the farmer. These could be considered by professional aggregators.
- Solutions for drying and storage can generally also be used for other crops outside of the coffee season. Seeking partnerships with non-coffee actors could improve the business case if other crop value is included and investment cost are shared.
- While the study has focused on Arabica losses, solutions for drying and storage can likely have a similar positive impact in Robusta communities, reducing losses, rejections and discounts for the full coffee sector and capturing a much larger value.

# roadmap

Arabica coffee in Uganda

# Recommendations

## Introducing first mile interventions to existing productivity-focused programmes can protect investments and increase impact.

- Many existing programmes and partnerships focus on farm level productivity. This is important, considering that yields are low and additional volume can drive impact on income. Entities working directly with farmers include coffee traders and exporters, micro-finance institutions and fintech, international donors and civil society.
- However, first mile losses are currently estimated at ~14%, and that immediately impacts the ROI of ongoing farm level investments if these first mile challenges are not addressed. Introducing first mile interventions as an add-on to existing farm level productivity programmes can protect return on investment for productive farms, and create additional impact on farmer incomes.
- Reducing first mile losses alone will likely be insufficient to lift farmers above the poverty line, and a combined effort to improve productivity and supply chain efficiency is required for sustainable impact.
- We recommend stacking interventions through partnership, so the same farmers can benefit from productivity, processing and storage interventions, leading to a combination of increased volume, reduced losses, improved pricing and overall increased profit and better livelihoods.
- Partnering with existing programmes and partnerships has the additional advantage of pooling technical assistance efforts, possibly reducing the total investment needed, and multiplying impact by combining improved productivity with better prices and reduced volume losses.

# Thank you