



AFRICAN COFFEE SECTOR

addressing national investment agendas on a continental scale

Rwanda Case Study

Sector study conducted by Agri-Logic and Valued Chain by assignment of
the Global Coffee Platform
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INTRODUCING NATIONAL COFFEE INVESTMENT AGENDAS FOR AFRICA



CHALLENGE:

- Currently Africa only supplies 10% of global coffee volumes, while coffee was first discovered in Ethiopia.
- In most African origins, yields are low, quality is inconsistent, and supply chains are inefficient.

OPPORTUNITIES:

- Buyers value certain coffees from Africa for their quality, and there is a potential to increase volumes to meet growing demand.
- Coffee may contribute to sustainable development in Africa's rural areas.

INVESTMENT AGENDAS:

- Greater understanding of challenges and opportunities in mainstreaming sustainable coffee production.
- Insight into required funding, return on investment, and possible public and private contributions.
- Insight into impact of investment based on quantitative research and stakeholder consultation. Benchmarks and analysis are based on 2015 data.
- Full reports available on the GCP website for Angola, Burundi, Cameroon, Côte d'Ivoire, Ethiopia, Kenya, Rwanda, Tanzania and Uganda.



CONTENT OF THIS REPORT

- Executive summary
- Positioning of coffee from origin
- Production areas in origin
- Supply & demand trend and
- Market interest in sustainability
- Value chain structure
- Farm level production systems
- Supply chain efficiency
- Differential competitiveness
- Cost of production
- Current farmer business case
- Production and price effects of investments
- Impact, cost and return per intervention
- Effect on farmer business case
- National sector business case
- Proposed public and private contributions
- Conclusion



INVESTMENT OPPORTUNITIES ANALYSIS

- The following slides describe the required investment (cost) and expected returns (revenue), as well as the expected impact on price, volume, quality and livelihoods.
- Investments are analysed on a sector level: total increased revenue in relation to total additional cost. On a sector level, all of these opportunities present a positive return on investment.
- Cost and benefits may not be attributed to the same actor in the value chain (e.g. government and buyers pay for farmer training, while the farmer gains most of the additional revenue from yield increase).
- Also, specific interventions may not lead to additional value creation, but to a redistribution of value within the chain (e.g. farmer grouping can lead to higher farm gate price, while export price and GDP contribution is not affected).
- Investment contributions are indicative based on stakeholder input. Investments and conditions to be negotiated within national public private platforms taking into account amongst others international competitiveness, governance, transparency and accountability assurance.

INVESTMENT AGENDA FOR THE RWANDA COFFEE SECTOR – EXECUTIVE SUMMARY



- Since 2000 **coffee supply from Rwanda has declined by 0.86% per annum**. Farming systems tend to be diversified with a mix of food crops and coffee. In times of low coffee prices other crops receive more priority.
- Rwanda has an estimated 400,000 coffee farmers. **Cost of production at farm level is low**. Even with additional investment in rejuvenation, cost of production in Rwanda would remain competitive compared to other producers of specialty coffee. **Rwanda differentials for ordinary grades are in line with neighbouring producers. Top grades can fetch exceptional differentials of up to 50 USct/lb and sometimes more.**
- Coffee farm sizes are extremely small, on average 0.08 ha. Productivity is in the mid-range for Africa at 450 kg/ha but further scope for improvement is present. **The small farm sizes make it nearly impossible for a coffee farming family to surpass the international poverty line from coffee alone.**
- The internal market is dominated by the private sector who also supply cooperatives with milling and logistical services for a fee. The top-5 exporters control around 73% of the exports. **The bulk of Rwandan exports go to markets that show a medium to high willingness to invest in sustainability.**



INVESTMENT AGENDA FOR THE RWANDA COFFEE SECTOR – EXECUTIVE SUMMARY

- There is significant potential to increase the coffee sector value in Rwanda through selective investment in farmer training, farm rejuvenation, and improved processing. **Over a period of 10 years a cumulative investment of ~43.7 million USD** (~27.7 million USD in farmer training, 11.5 million in rejuvenation and 4.5 million in processing capacity) **can create 294 million USD in additional value** over the same 10 year period at today's coffee and input prices.
- **The share of certified sustainable supply in Rwanda is high at around 30%. It is unclear how much of this volume is sold against premium payments.** The Net Present Value for further investment in certification is negative, largely due to small farm sizes and low volumes per farmer.
- **Productivity could increase by 86%** over 7 to 9 years. This requires large-scale investment in a combination of farmer training, rejuvenating of over 12,000 ha. Variety selection to maintain Rwanda's coffee quality should be a key consideration.
- Much of the added value created through such investments flows into the rural economy.
- **Farmers' income can grow 1.8-fold**, but coffee alone will not provide sufficient income to lift the average farmer household above the poverty line of 1.9 USD/day. A 5.6-fold increase is required for that.



RWANDA

Focus on yields, rejuvenation and processing capacity

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POSITIONING OF RWANDA

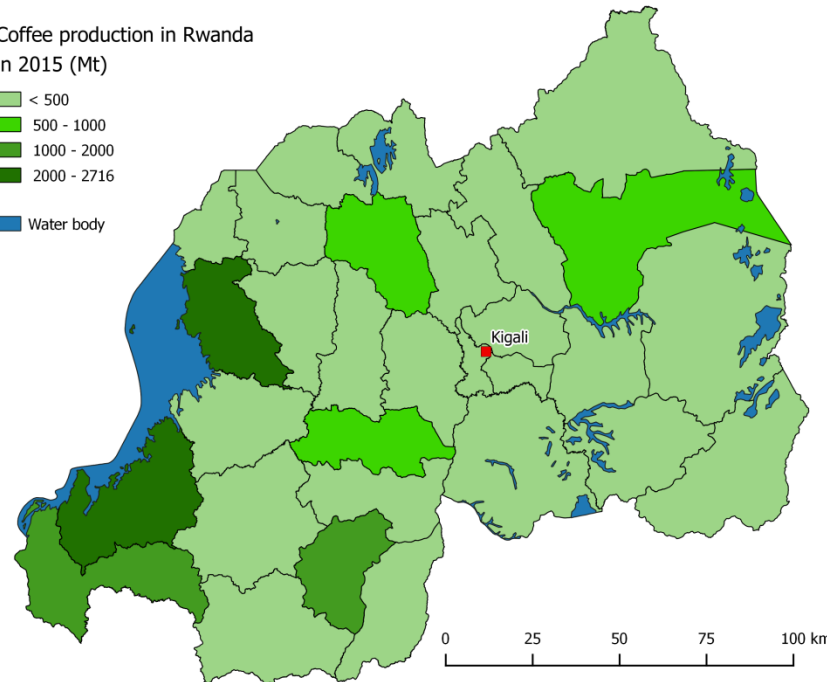
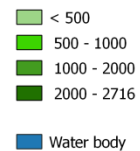


Item	Value
Total volume (3 year average)	15,000 Mt
% of global production	0.16%
% Arabica – Robusta	99% – <1%
% natural – semi-washed – fully washed	<1% – 55% – 44%
Compound Annual Growth Rate of coffee production (2000-2015)	-0.86%
Main export markets	USA, EU, Kenya, Japan
Market segments	Mainstream arabica and high quality arabica, small volume of robusta
GDP	8.3 billion USD
GDP – agriculture	2.7 billion USD
GDP – coffee	0.062 billion USD

RWANDA COFFEE PRODUCTION AREAS BY DISTRICT, TYPE AND SUPPLY LEVELS



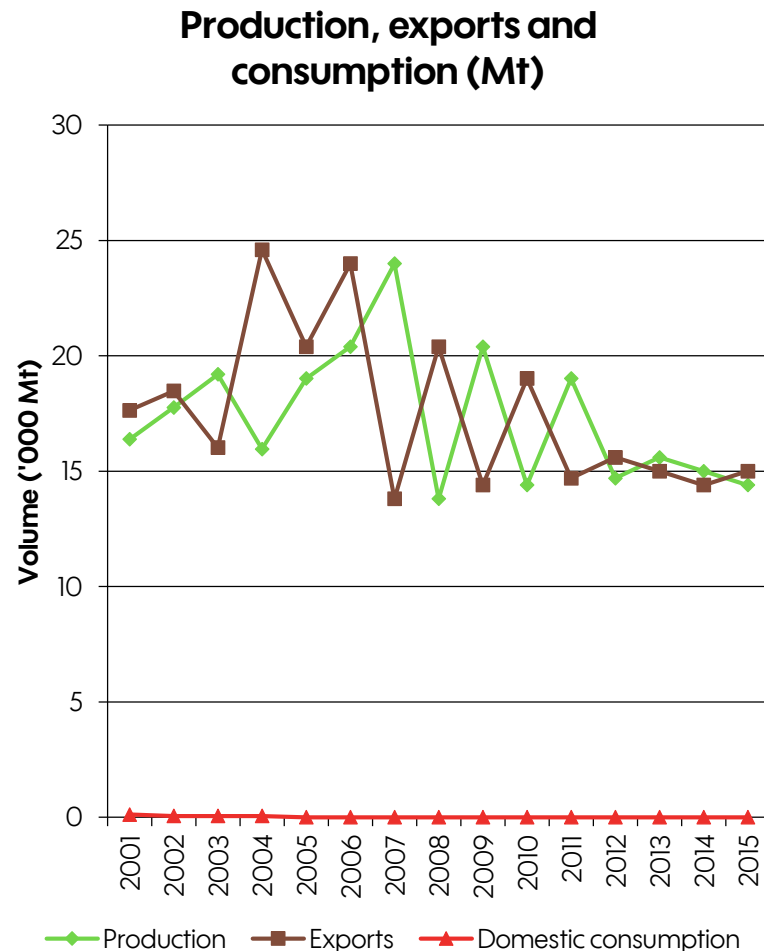
Coffee production in Rwanda
in 2015 (Mt)



- Arabica is grown in all districts with a concentration of production in the west of the country around lake Kivu.
- Rwanda has the highest population density in Africa at 370 people per square kilometre.
- Eighty seven percent of the population live in rural areas and rely mostly on subsistence farming for their livelihoods.
- Therefore, most of the agricultural land is used for food crops (92%) with just 3% dedicated to coffee.
- Bourbon and Typica are the predominant varieties.
- Higher-yielding hybrids have been introduced, but these tend to require higher investments in inputs which farmers can not easily afford and hence do not appear to perform to their potential.

Sources: Census data, interviews, TNS, AL and VC analysis

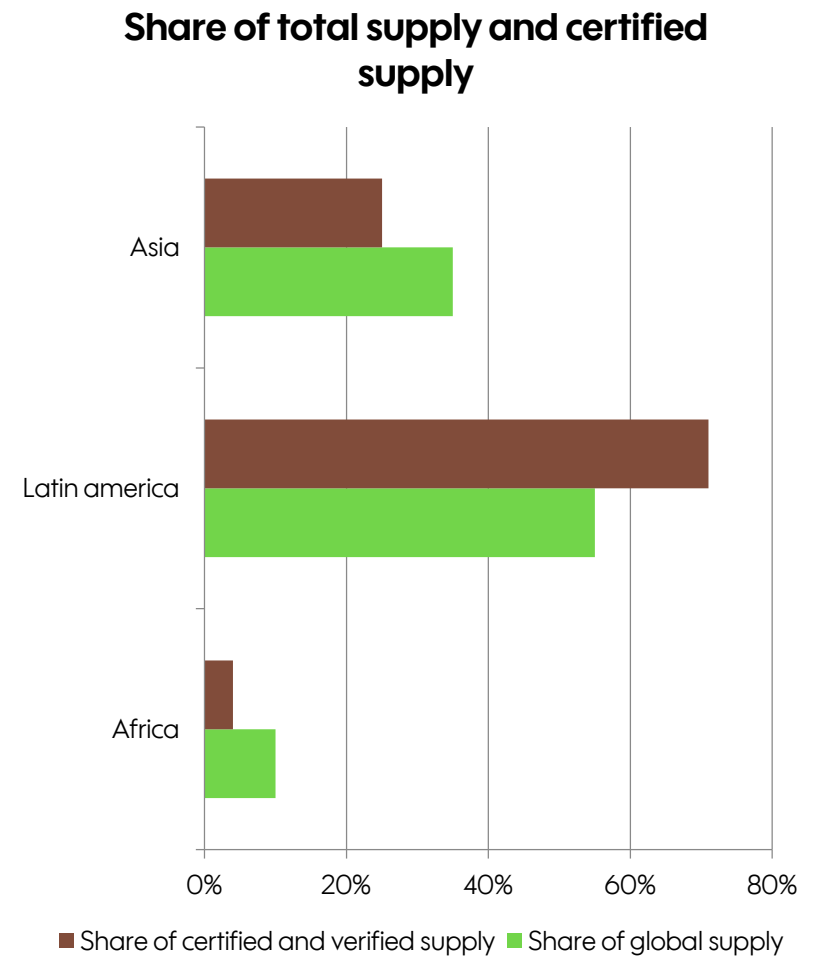
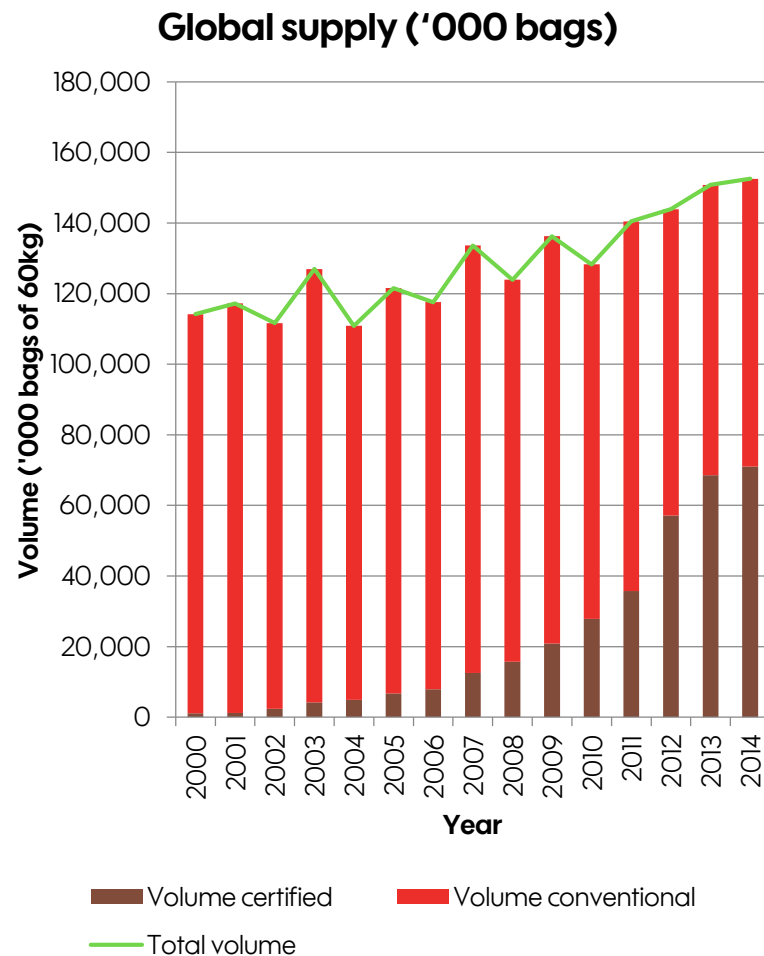
RWANDA PRODUCTION VOLUMES ARE HIGHLY VOLATILE



- Coffee volumes are showing a downward trend, but supply appears to have stabilised 2012.
- Compound Annual Growth Rate is negative: -0.89%.
- Arabica, especially under sub-optimal management, can display cyclical production which can be exacerbated by unfavourable weather conditions and pest and disease pressure. This appears to have happened between 2004 and 2010.
- Pest and disease pressure affect supply. Coffee leaf rust and the berry borer in particular can cause significant losses of up to 50%. Few farmers have the ability to apply proper control measures to manage these issues.
- Domestic consumption is negligible.

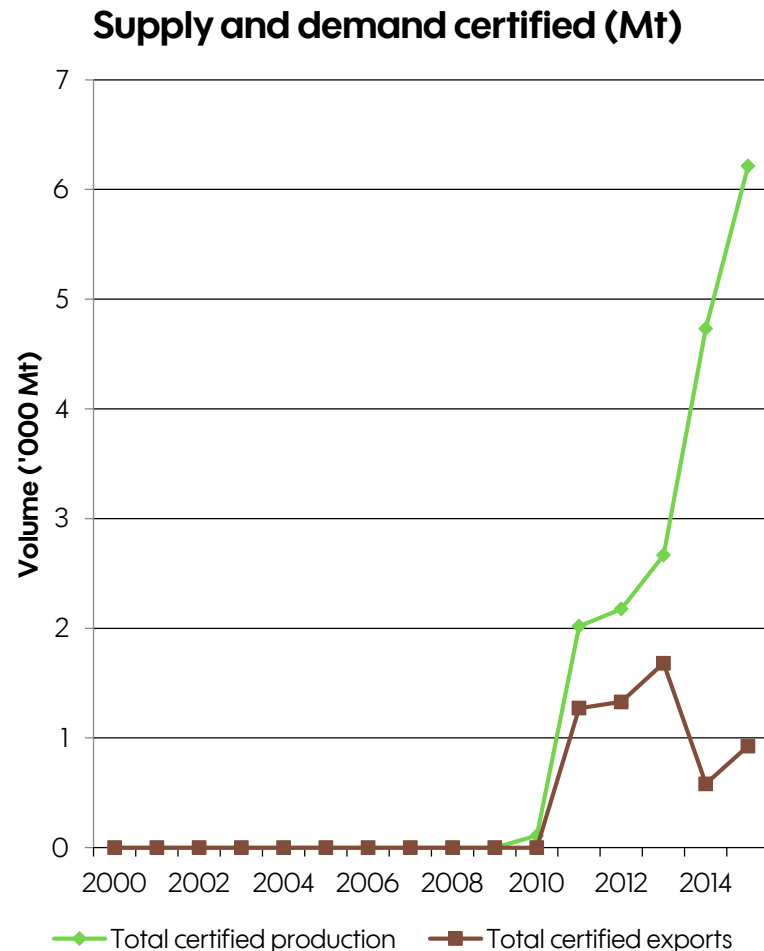
Sources: USDA, interviews, AL and VC analysis

AFRICA LAGGING IN SHARE OF CERTIFIED SUSTAINABLE SUPPLY



Sources: USDA, CTA, AL and VC analysis

MARKET SHARE OF CERTIFIED COFFEE HIGH IN AFRICAN CONTEXT



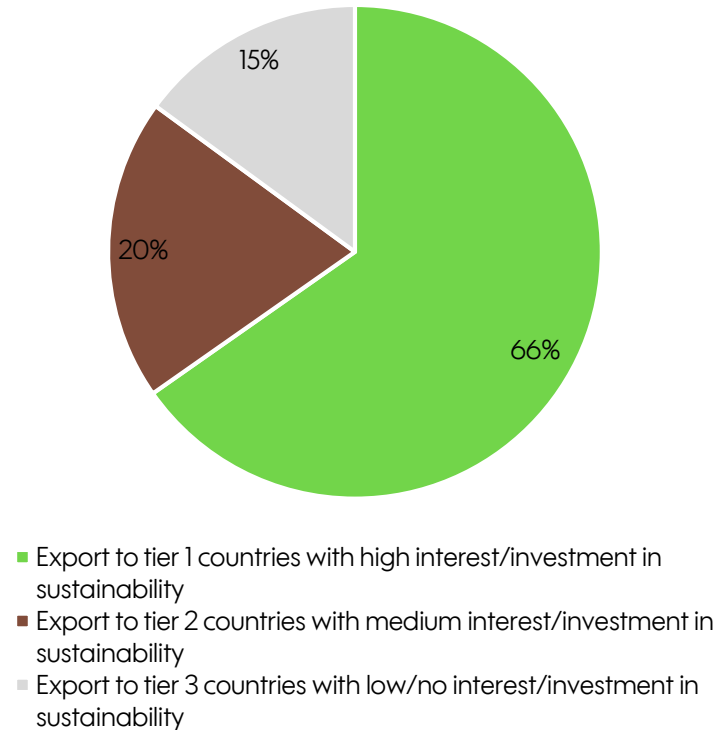
- Since 2014, a large share of Rwandan production is certified or verified.
- This is primarily driven by demand from international clients. A single international exporter is responsible for the large jump in certified/verified supply in 2014 and 2015.
- A small share of certified supply is Fairtrade, that volume is controlled by cooperatives
- Exact export figures of certified verified coffee are fuzzy as Rainforest Alliance and 4C do not make these numbers available. The total certified exports is certainly higher than what is depicted here.
- Premiums tend to be paid for exported certified coffee, but small volumes per farmer make it challenging to obtain a positive return on investment.

Sources: Industry interviews, GCP, Fairtrade, AL and VC analysis

THE OUTLOOK FOR MARKET INTEREST IN SUSTAINABILITY IS POSITIVE



Rwanda exports (% of total) and market interest to invest in sustainability in destinations



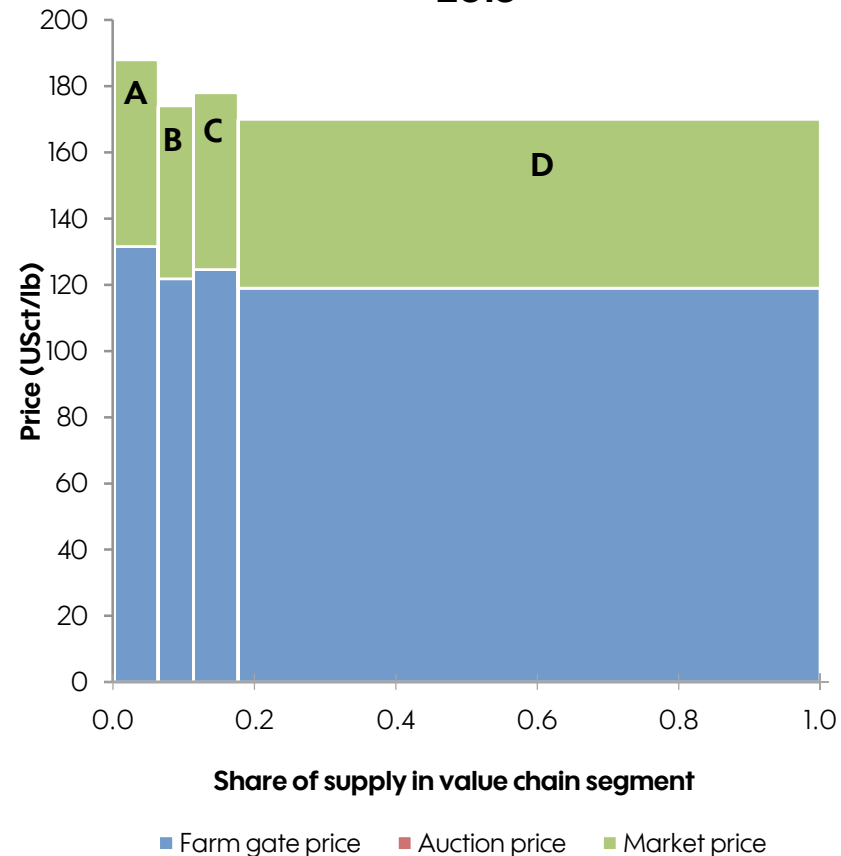
- Tier 1 markets: USA, UK, Switzerland, Germany, Netherlands.
- Tier 2 markets: France, Belgium, Italy, Spain, Scandinavia.
- Tier 3 markets: rest of southern Europe, all others.
- Currently a large share of Rwanda coffee is exported to the USA (33%), Belgium (17%) and Germany (11%).
- The sector has seen significant investment from donors and, since liberalisation, from the industry.
- The large share of coffee exported to Tier 1 and 2 markets indicates that more investment from industry appears likely.

Sources: OEC, NAEB, VC and AL analysis

LOCAL MARKET DOMINATED BY TRADERS AND EXPORTERS



Value chain structure Rwanda Arabica 2015



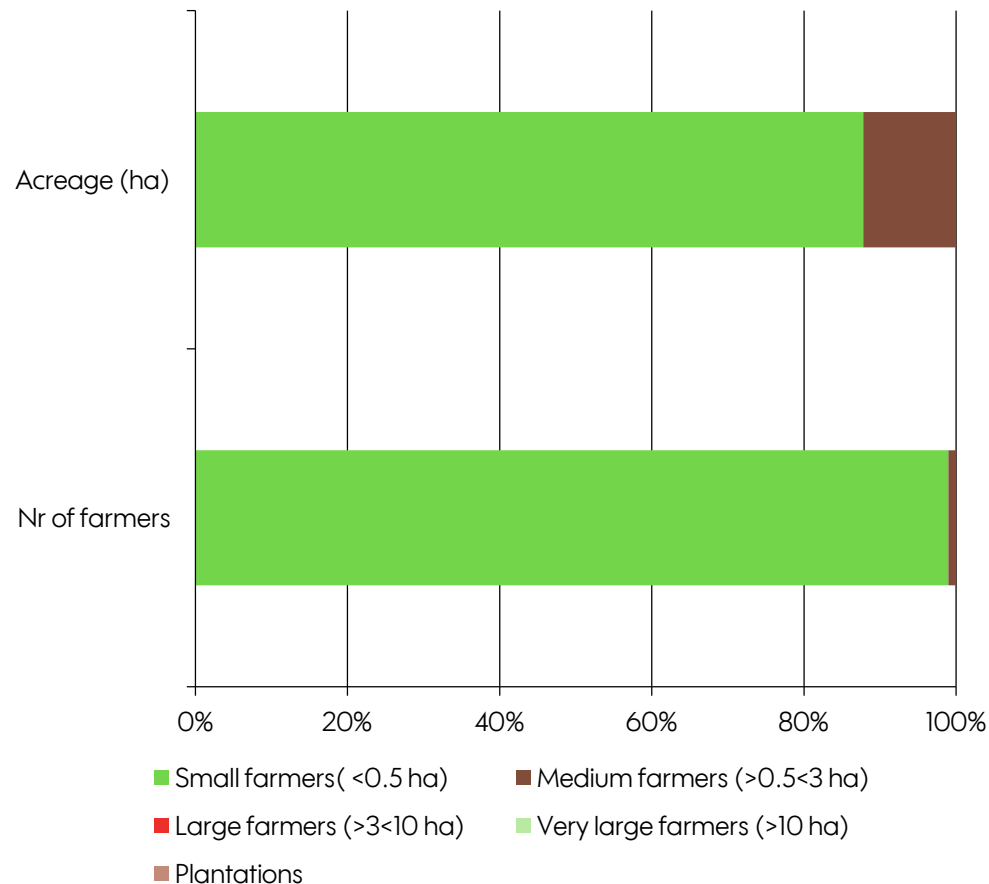
- 4 different market channels characterise the local market.
- Domestic market in this graph as it takes up less than 1% of supply
- Although 20% of farmers are members of cooperatives their market share is 6% (C). Unions of cooperatives also have 6% market share (A).
- Part of the the cooperative membership sell their coffee to private sector operators (B).
- Competition on the internal market is fierce, little differentiation in farm gate price, although cooperative farm gate prices are slightly higher due to quality differentiation
- Bulk of exports in hands of private sector, working through, traders and washing stations (D).
- Five companies are responsible for 73% of registered exports.

Sources: NAEB, interviews, AL and VC analysis

SECTOR CONSISTS PREDOMINANTLY OF SMALL-SIZED FARMS OF LESS THAN 0.1 HA



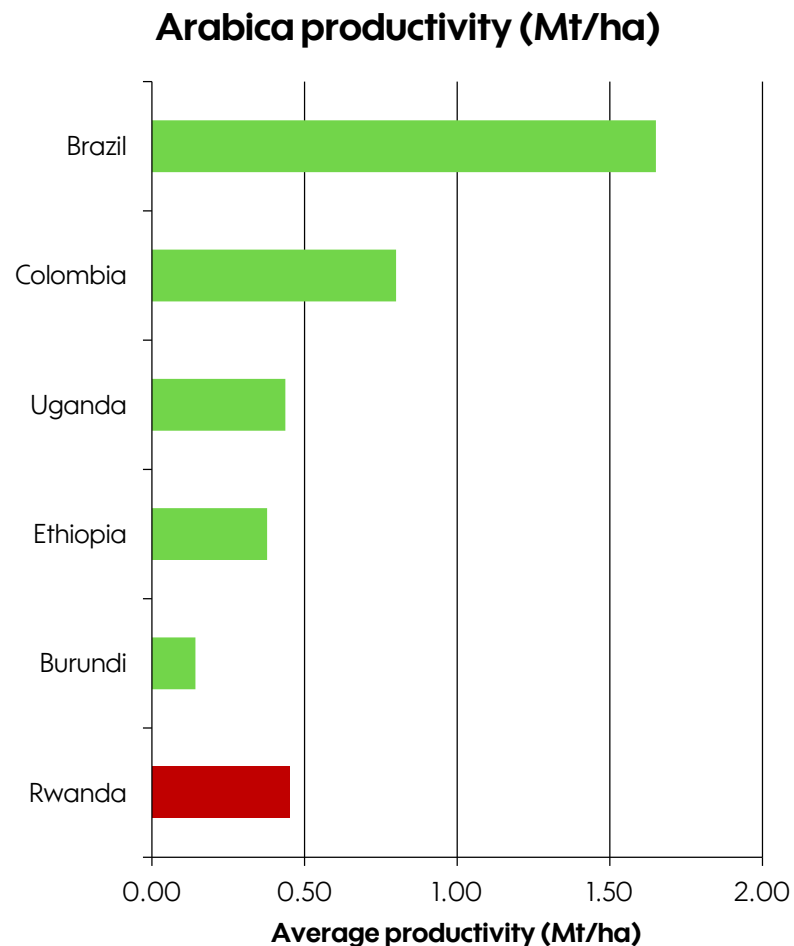
Nr of farmers and acreage distribution



- Average farm size: 0.08 ha.
- Acreage and farmer numbers vary between sources.
- Our assumption: 394,000 farmers and 32,000 ha in line with the 2009 coffee census. A new census was carried out in 2015, but results not published at time of writing.
- Land shortages are prevalent, farm sizes per household have come down significantly as plots are split between siblings when inherited.
- Small scale farmers control most of the acreage.
- A small number of larger farms are operational, but no large scale plantations.

Sources: NCCB, PSD, FAO, interviews, AL and VC analysis

CURRENT PRODUCTIVITY LEVELS ARE LOW- TO MID-LEVEL AND COULD GROW FURTHER



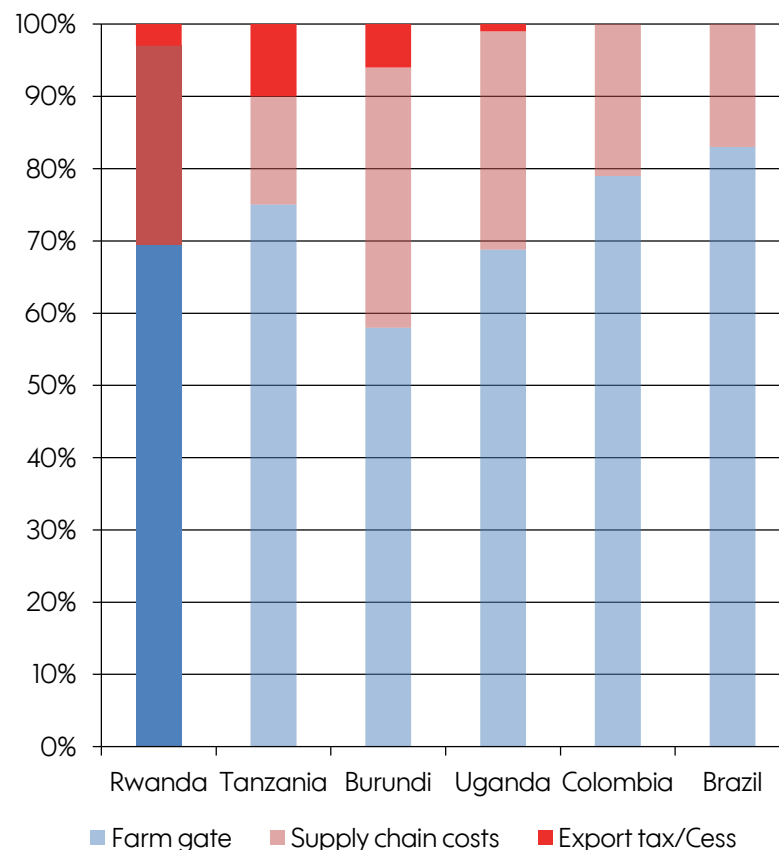
- Productivity of arabica is 450 kg green coffee per ha.
- Productivity in arabica market leader Brazil is close to a factor 4 higher. Productivity performance is comparable with Uganda and Ethiopia and significantly higher than neighbouring Burundi.
- Farm sizes are however very small, so despite high productivity, volumes produced per farmer are much smaller than in other origins.
- Productivity in Rwanda could increase further, achieving close to 700 kg/ha appears to be feasible.

Sources: USDA, FAO, interviews, AL and VC analysis

TAXATION LEVEL IS MEDIUM AND SUPPLY CHAIN OPERATES FAIRLY EFFICIENT



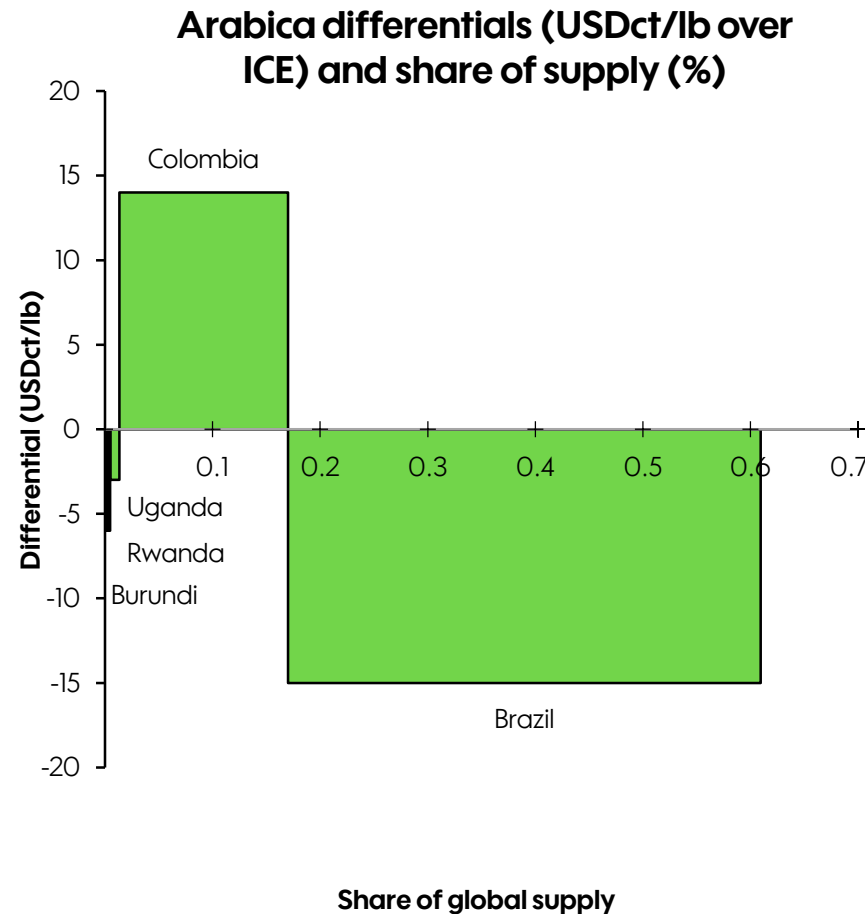
Value distribution Arabica (% of FOB price)



- Rwandan coffee exports are subject to a 3% registration fee on the export value. This fee is payable to the National Agricultural Export Development Board and is reinvested in the sector.
- Part of the NAEB mandate is to distribute inputs. Coffee that was produced using such inputs is subject to an additional levy of 5.5 USct/lb for fertilisers and 0.6USct/lb for pesticides
- Taxes are lower than in Tanzania, Burundi and DR Congo (not shown) and reportedly some smuggling into Rwanda takes place. Similarly Rwandan coffee is sometimes smuggled into Uganda to avoid levies. We do not know the scale of this issue.
- On average farmers receive 69% of the FOB value.
- Supply chain efficiency could be enhanced.

Sources: Interviews, USAID, NAEB, AL and VC analysis

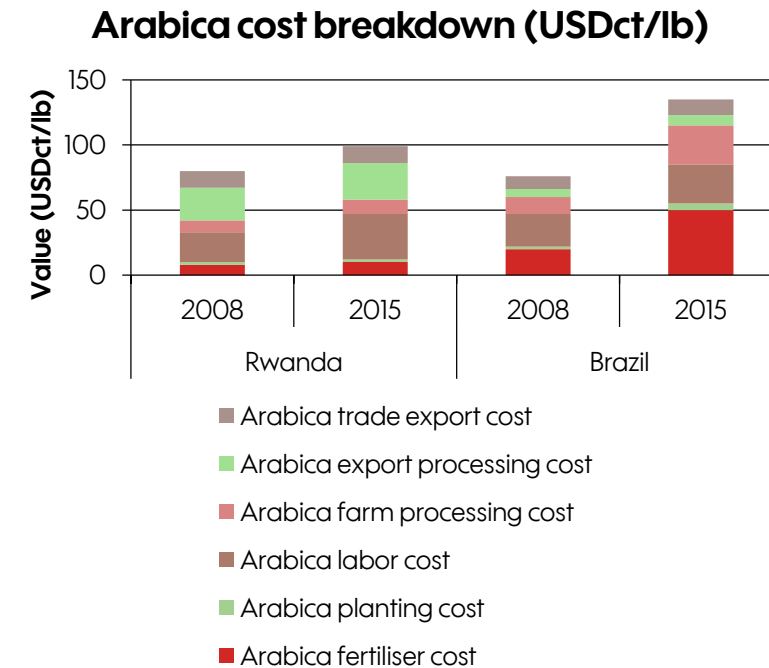
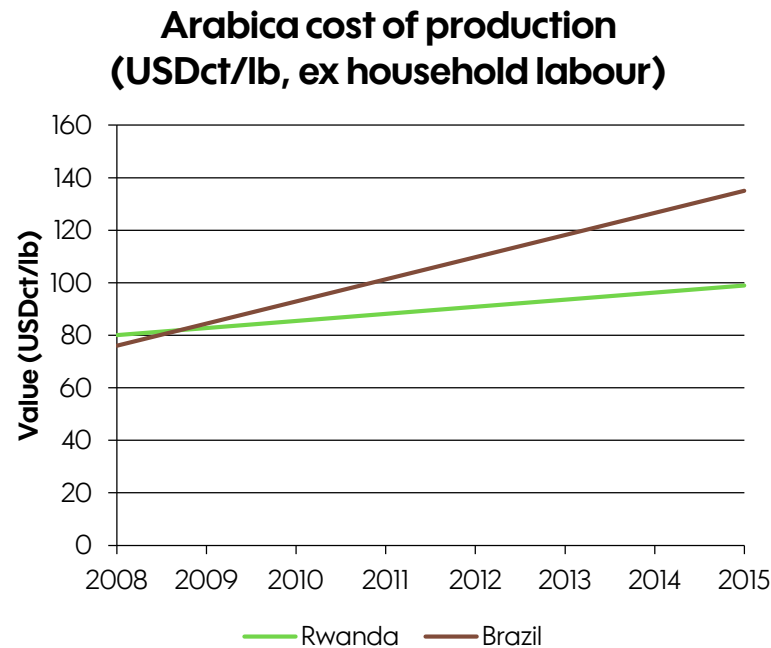
DIFFERENTIAL FOR ORDINARY GRADES IS COMPARABLE TO BURUNDI, TOP GRADES FETCH GOOD DIFFS



- Differential for Rwandan arabica Ordinary grade is around -6 USct/lb, similar to Burundi.
- Screen 15 fully washed can go for >10 USct/lb over ICE and in exceptional cases reaching 50 USct/lb.
- While the 50USct/lb is exceptional it is indicative of quality potential. The share of fully washed coffees has increased significantly over the last years on the back of concerted industry and government efforts and now reaches around 45%.
- We think there is some scope for further growth of the fully washed segment, probably to around 60-70% of supply.

Sources: Olam, NAEB, USDA, AL and VC analysis

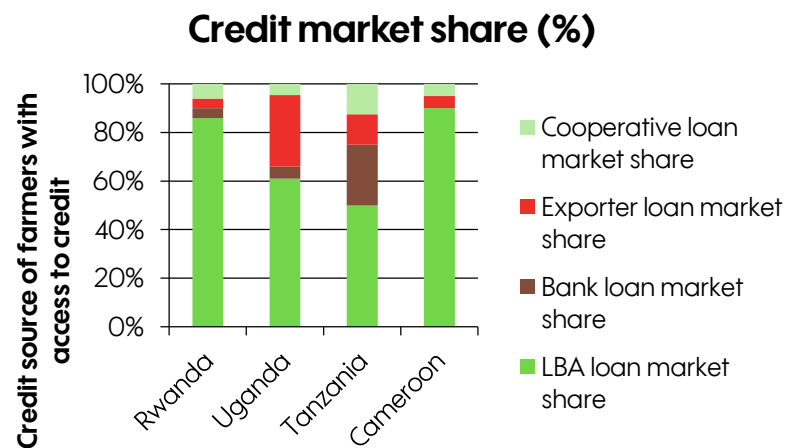
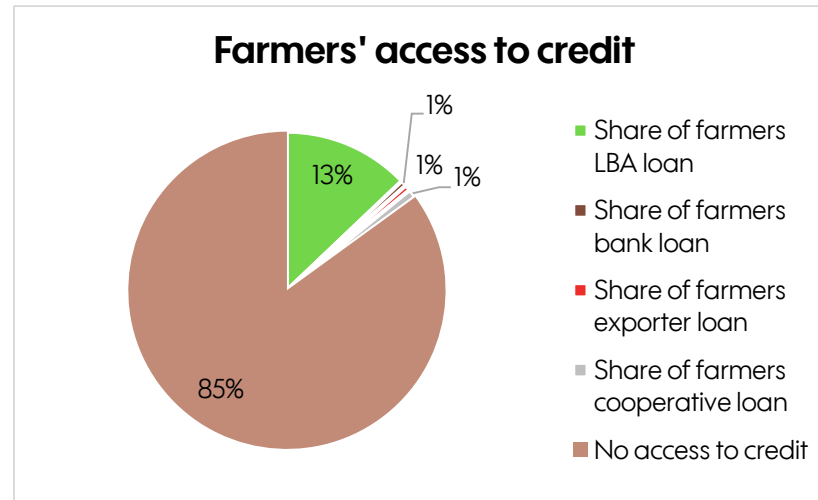
HOWEVER, COST OF PRODUCTION IS RELATIVELY LOW, WHILE COST IN BRAZIL INCREASE



- Increasing cost in Brazil, especially labour and fertiliser, can be an opportunity for Rwanda and other arabica origins in Africa. Efficiency gains in export cost could further enhance competitiveness.
- Historically, low-cost producers have gained dominance (e.g. Brazil and Vietnam).

Sources: Interviews, JDE, 4C, TNS, AL and VC analysis

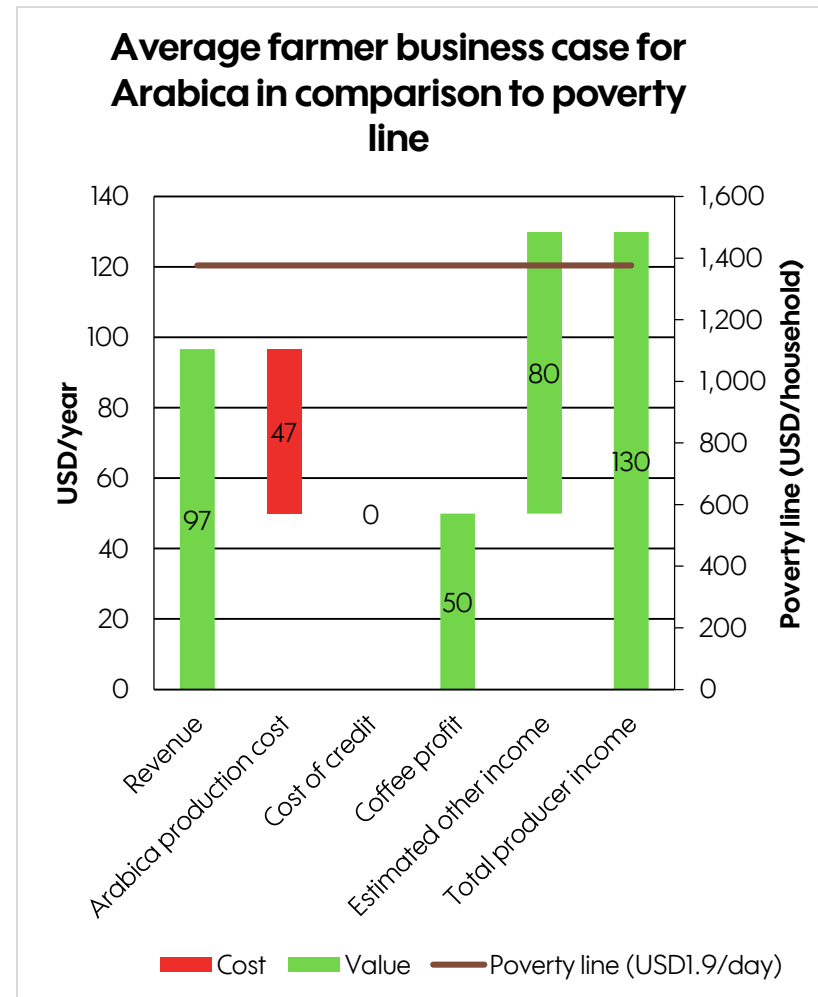
FEW FARMERS HAVE ACCESS TO CREDIT, PROHIBITIVE COST PREVENTS INVESTMENT IN COFFEE



- An estimated 15% of farmers has access to credit, much of this is provided by local traders or the informal sector, often at steep interest rates.
- Credit is usually short term for a coffee season of maximum 9 months.
- Local traders' (listed as LBAs here) interest rates are around 9% per month on average, which equals 108% annually or 81% per coffee season.
- LBAs have an estimated 86% share of the farmer credit market (which constitutes of around 16% of the farmers).
- The weighed average interest rate is 8% per month. Given high cost of credit much of its use is for emergency purposes, not investment.

Sources: Interviews, USDA, AL and VC analysis

COFFEE FARMERS EARN RELATIVELY LITTLE FROM THEIR COFFEE



- With average coffee farm size being 0.08ha, volume of coffee sold by the average household is small.
- Despite receiving above average prices compared to other origins, revenues and profits from coffee are small.
- We estimate that the value of other income sources amounts to 80 USD/household per year.
- While a significant increase in productivity would be desirable, the small-scale of the average farm will limit the absolute effect of such a development.
- With an average family-size of 4.8 people per household, net coffee income is 10 times less than the poverty line of 1.9 USD/capita/day (adjusted for purchasing power parity).

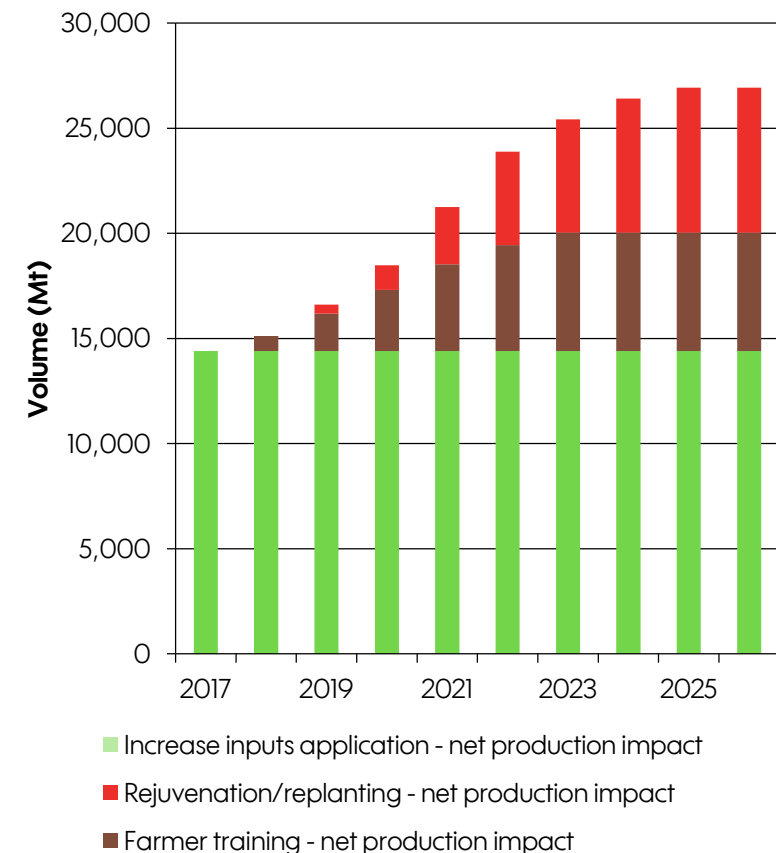
Sources: Interviews, USDA, AL and VC analysis

MODELLING INVESTMENT OPPORTUNITIES – PRODUCTION EFFECTS



- Modelling 3 investment opportunities:
 - Farmer training
 - Rejuvenation/replanting
 - Local processing capacity
- A combination of these 3 interventions could increase average production per farmer (and per ha) by 87%.
- This would bring national production to ~27,000 Mt by 2024.
- In modelling price effects we have not included certification. Rwanda's share of production that is certified is already high and buying decisions are driven more by physical product quality.

Production effect of investment opportunities

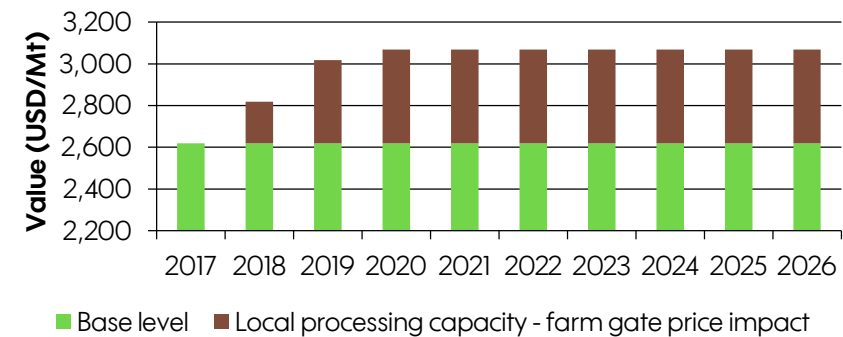


MODELLING INVESTMENT OPPORTUNITIES – PRICE EFFECTS

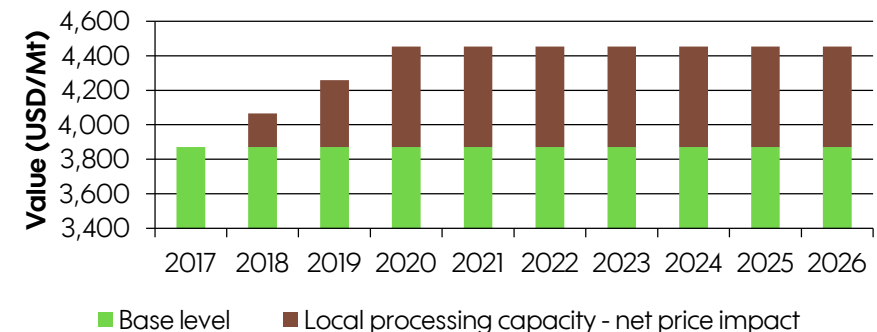


- Assuming weighed average base price stable over time.
- Given the varieties grown in Rwanda, quality potential is excellent.
- Currently around 45% of supply is fully wet processed. This share could grow to by an additional 15 percentage points resulting in significant price effects.
- Going beyond 60% to 70% of supply as fully wet does not make a lot of sense. Coffee harvested at the start and end of the season tends to be of lower quality. For such coffees added value from fully wet processing is negligible and may be negative.
- Detailed models for the first 3 opportunities which show a positive business case are shown on the following pages.

Farm gate price effect of investment opportunities



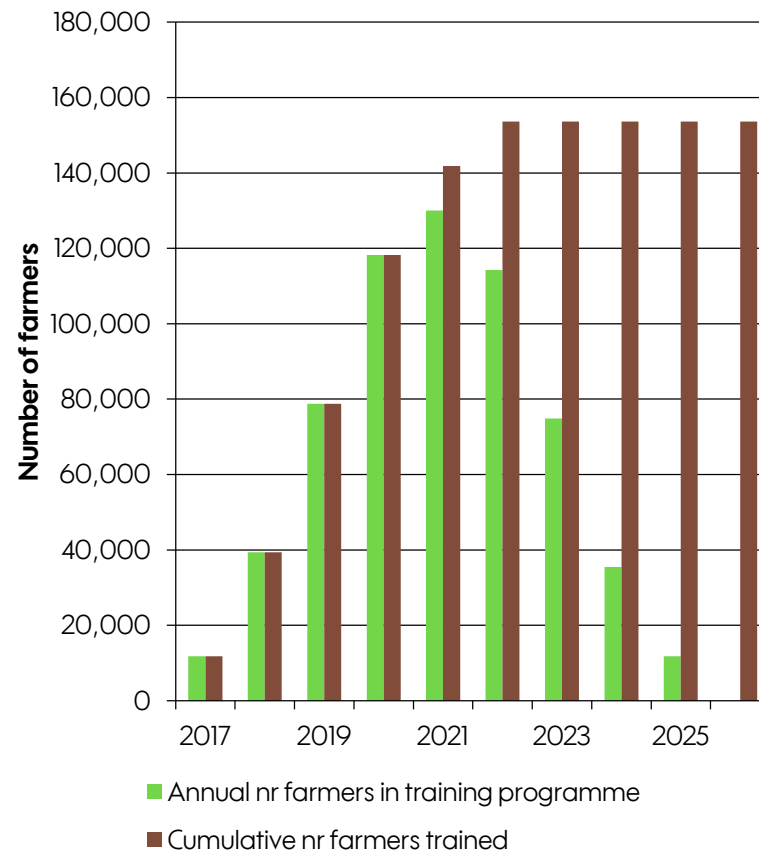
Export price effect of investment opportunities



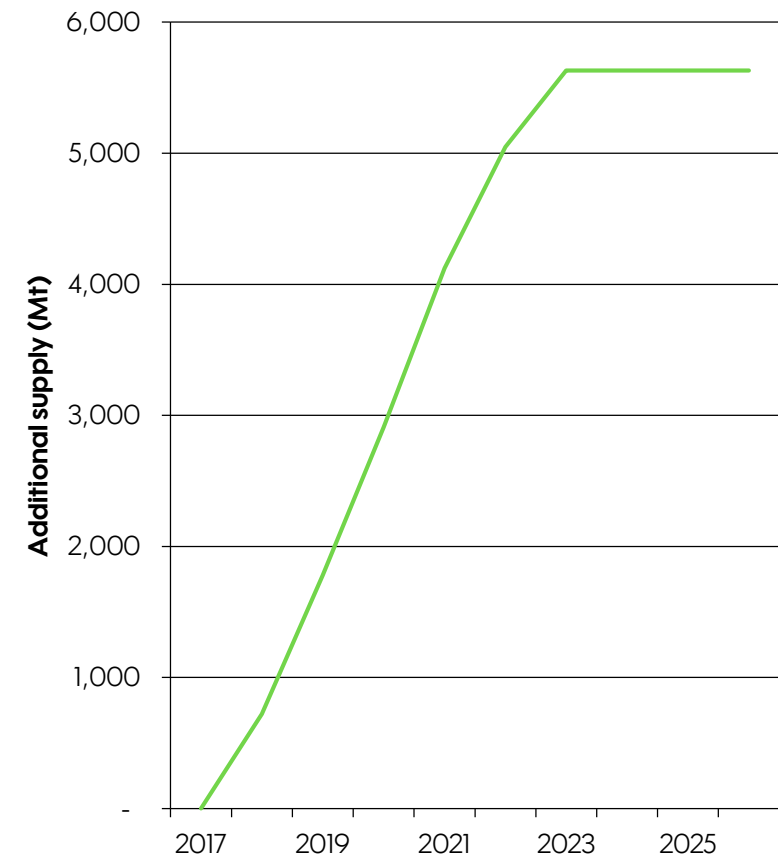
FARMER TRAINING INVESTMENT CAN GROW CURRENT SUPPLY BY >30%



Number of farmers enrolled in training program



Additional supply from farmer training programme (Mt)



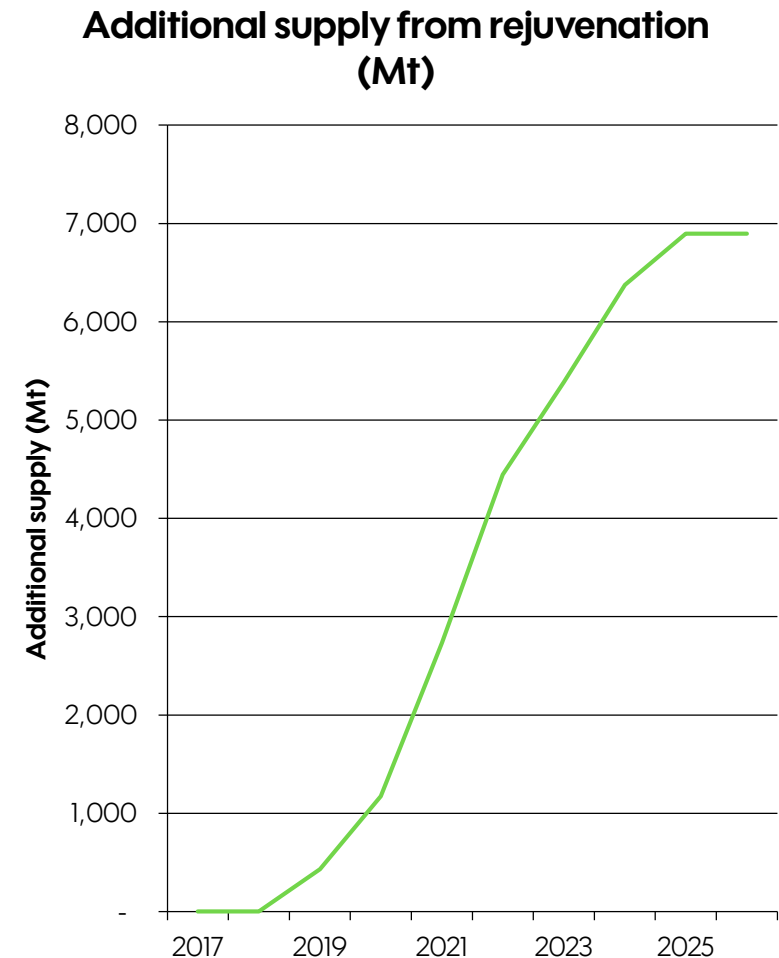
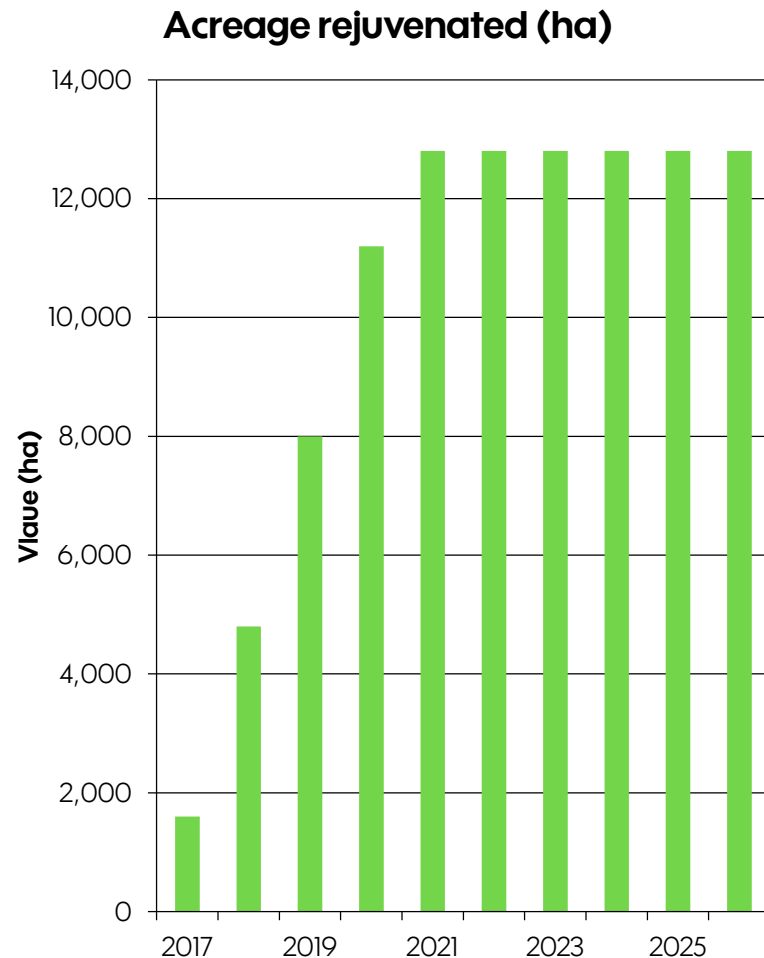
FARMER TRAINING OFFERS POTENTIALLY EXCELLENT RETURNS ON INVESTMENT



- For training on Good Agricultural Practices to be effective it needs to be participatory, intensive and should run for at least 4 years.
- A challenge in Rwanda is the relatively small average farm size. For investment in training to yield results a certain farm scale is required. We therefore expect around 40% of the farmers that own relatively larger farms to be reached by this investment.
- Rwanda has already seen its share of coffee projects and other farm related initiatives. We expect a pool of experienced agronomists and trainers to be available in the sector which can lower the required investment in capacity building for trainers.
- We therefore budget 45 USD/farmer/year in training costs, assuming 40% of the close to 400,000 farmers reached the total investment amounts to 27.7 million USD over 9 years.

Indicator	Value (10 years)
Cumulative nr of farmers reached	153,660
Additional volume coffee per annum in steady state (Mt)	5,632
Total investment	\$ 27,658,800
Total return	\$ 143,688,304
NPV (10%)	\$ 57,663,425
NPV (20%)	\$ 31,445,701
Investment per farmer	\$ 180

REJUVENATION INVESTMENT TAKES A WHILE TO SHOW EFFECTS...



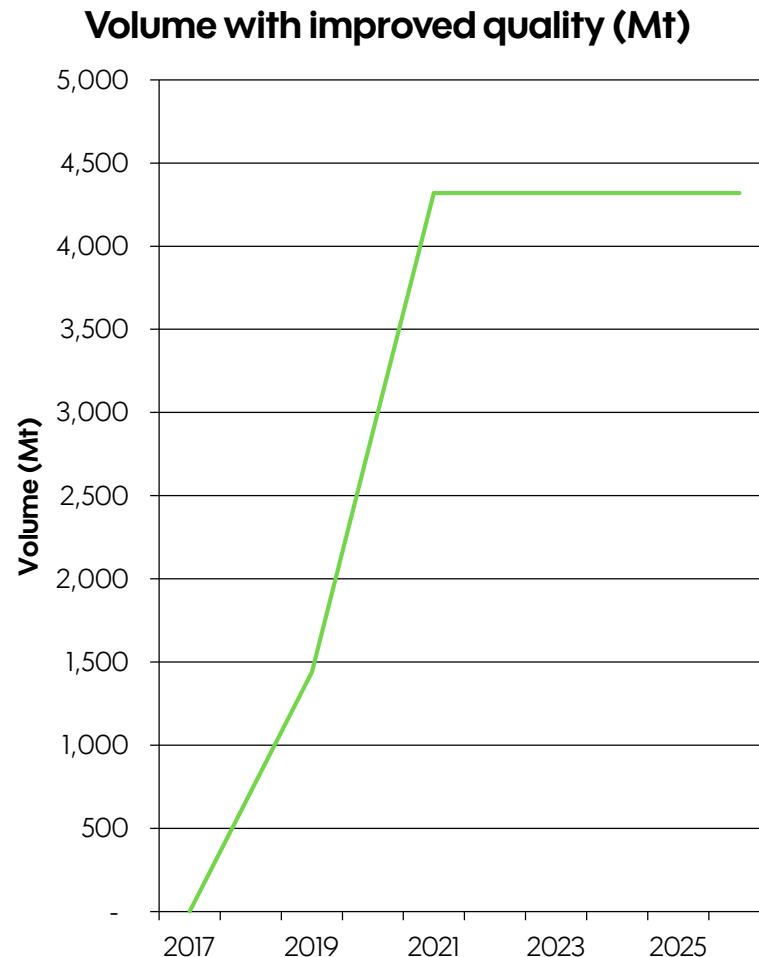
...BUT RETURN ON INVESTMENT IS POSITIVE



- Cost per ha for replanting and rejuvenation in Rwanda is assumed to be higher than in other countries. Farm sizes are very small and farmers are likely to require additional credit to bridge the gap between rejuvenation or replanting and having production.
- It will be imperative that any replanting programme uses suitable varieties. More than in many other origins, the cup profile of the distributed varieties should play a major role in variety selection.
- Rejuvenating existing plantations by phased stumping is also considered. The turn-around time will be shorter and total investment lower.
- We assume that an ambitious 40% replanting/rejuvenation rate across the sector can be achieved. This would cover 12,800 ha.
- Once concluded, the replanting programme can contribute around 6,895 Mt of additional supply per annum.

Indicator	Value (10 years)
Cumulative acreage replanted (ha)	12,800
Additional volume coffee per annum in steady state (Mt)	6,895
Total investment	\$ 11,520,000
Total return	\$ 132,934,492
NPV (10%)	\$ 56,526,850
NPV (20%)	\$ 28,460,631
Investment per ha	\$ 900

INVESTMENT IN PROCESSING CAPACITY CAN HELP TO EXPAND THE SHARE OF FULLY WET PROCESSED COFFEES



- Rwanda's share of fully wet processed coffees has more than doubled over the past 10 years from around 20% in 2006 to 45% in 2015.
- It does not make economical sense to target 100% fully washed coffees. We expect the optimum to be around 60% of supply.
- Price effects can be significant. At farm gate the price differential between semi- and fully washed coffees was around 40 USct/lb in 2015 and at export around 50 USct/lb.
- If supply of fully washed coffees would reach 60% of total supply in steady state an additional volume of close to 4,500 Mt of improved can enter the market.

ASSUMING UTILIZATION RATES OF NEW WASHING STATIONS IS OVER 60%, RETURNS CAN BE ATTRACTIVE



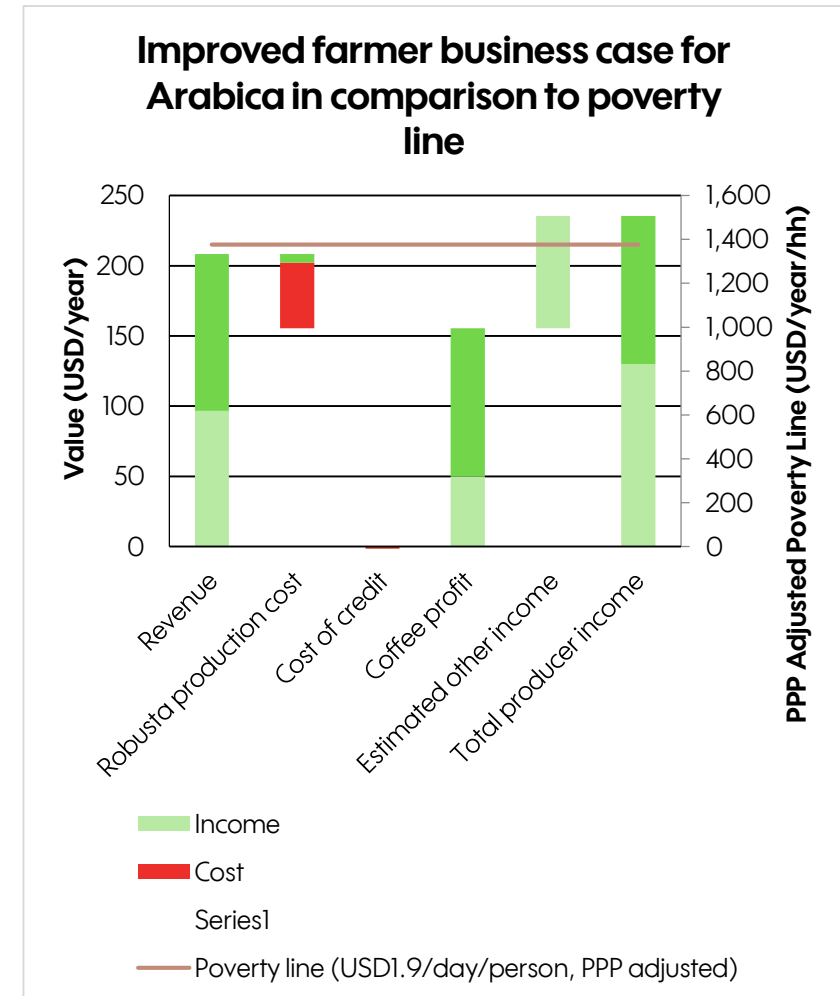
- According to the NAEB, the 245 washing stations currently operational are seeing high levels of utilization rates, ranging from 75% to close to 100%.
- Further growth of the share of fully washed coffee is likely to require additional washing stations in strategic locations.
- With a little over 4300 Mt of projected additional supply and taking geographical distribution of supply into account we expect a requirement of close to 200 additional small-scale washing with a seasonal capacity of 25 Mt green coffee each.
- To limit investment we propose to conduct this type of investment with cooperatives and private sector entities that have a sound track record and help them expand their processing footprint.

Indicator	Value (10 years)
Additional volume of improved quality per annum in steady state (Mt)	4,320
Additional value of improved quality per annum in steady state	\$ 8,363,492
Total investment	\$ 4,492,800
Total return	\$ 66,907,939
NPV (10%)	\$ 34,047,673
NPV (20%)	\$ 20,468,816
Investment per Mt	\$ 480

SIGNIFICANT POSITIVE IMPACT ON FARMERS, BUT OTHER INCOME NEEDED



- The 3 investment opportunities that show a positive return can have a significant impact on farmer livelihoods, improving annual coffee profit by >210% to 156 USD/farm.
- Total producer income would then increase to 236 USD/household.
- This however is still not sufficient for a full farming family in relation to the poverty line (value of home consumption of other crops not factored in).
- To lift farmers out of poverty, further income is needed. A 5.6-fold increase in income would be needed for that. Given high population densities, such improvement is unlikely to come from bringing new land under cultivation.
- A further improvement in productivity is feasible bio-physically, but very unlikely given constraints of access to inputs.

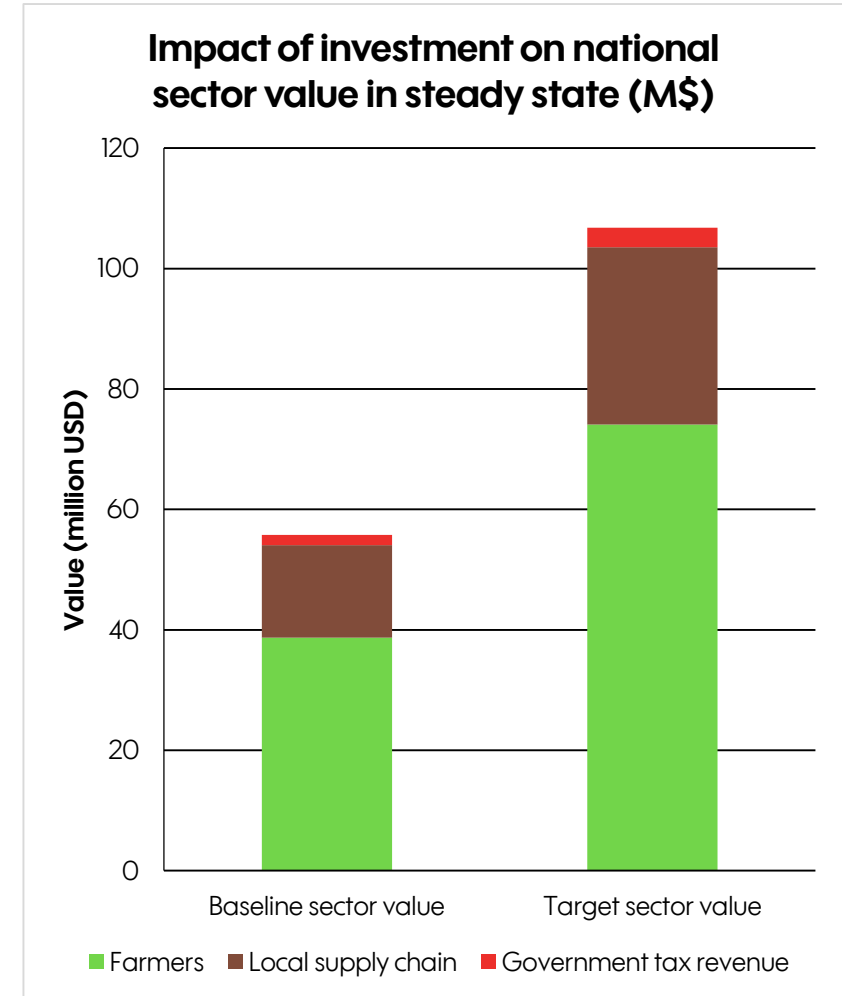


NATIONAL BUSINESS CASE: SIGNIFICANT INCREASE IN SECTOR VALUE FOR ALL



Summary	USD over 10 years
Total investment	\$ 43,671,600
Total return	\$ 294,046,739
NPV (10%)	\$ 120,293,857
NPV (20%)	\$ 63,016,315

- Investment in coffee can significantly increase the sector value for all actors in the value chain. The majority of value flows into the rural economy but other local supply chain also see significant improvement
- As productivity improves and additional washing stations become operational, local supply chains benefit from more volume and better prices, primarily from additional supply.

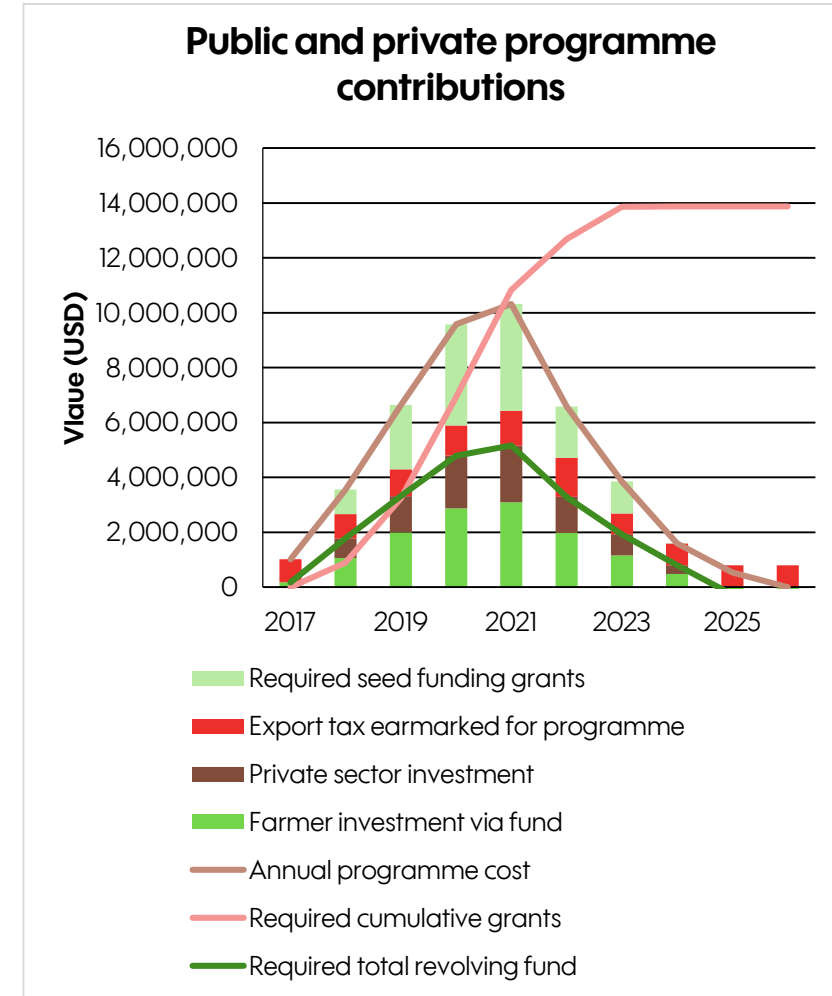


INVESTMENT SHARED BY NATIONAL GOVERNMENT, PRIVATE SECTOR, GRANTS



- Assuming that 50% of the export tax (NAEB levy) is invested in this programme, farmers and the private sector could cover around 50% of the total investment.
- The shortfall could be made up with grant funding of 13.9 million over 7 years.
- To facilitate farmer and private sector the ACF revolving fund would have to be around 5.1 million USD. gap and allow investment in farmer organisation building.
- As sector revenues grow the export tax could be reduced to 1.5% to enhance competitiveness.

Summary	Value
ACF revolving fund size	\$ 5,162,250
Required grant funding	\$ 13,871,848
Required grant funding %	32%
Required national budget (% of export tax)	50%



Contributions are indicative based on stakeholder input. Investments and conditions to be negotiated within national public private platforms taking into account amongst others international competitiveness, governance, transparency and accountability assurance.



CONCLUSIONS

- The coffee sector contributes a major part of Rwanda's export earnings. An estimated 400,000 households are involved in coffee production.
- There is significant potential to increase coffee sector value in Rwanda through selective investment in farmer training, farm rejuvenation and improvement of processing capacity. Productivity can increase by 86% from 0.45 Mt/ha to 0.84 Mt/ha. The increased value largely flows into rural economy.
- Coffee alone will not provide sufficient income for a full farmer household, under current conditions it appears unlikely that the gap to the poverty line can be met with agricultural activities. It is unlikely that farmers will be lifted out of poverty in the short- to mid-term, despite investments.
- Total programme investment amounts to an estimated 43.7 million USD over 10 years that would generate a return across the sector of 294 million USD at current prices.



Sources

Global Coffee Platform, Sucafina, Olam, NAEB, Café Africa, Jacobs Douwe Egberts, Lavazza, Nestle.

Data

US Department of Agriculture, Food and Agriculture Organisation, International Coffee Organisation, NAEB, Technoserve, USAID, 4C Association, UTZ Certified, Fair Trade, Agri-Logic

About the Global Coffee Platform

The GCP is a collaboration between the 4C Association and the Sustainable Coffee Program of IDH – The Sustainable Trade Initiative. The Global Coffee Platform is an inclusive multi-stakeholder sustainability platform aligning the activities of a diverse network of stakeholders to set into action the global commitments made through Vision 2020 and create a thriving and sustainable coffee sector.

About Agri-Logic

Agri-Logic – management, consultancy and research – operates where agricultural production, development, international trade and consumer markets intersect. We combine a thorough understanding of farm level reality and commodity trade with scientific research skills and a track record in sustainability strategy design and implementation, to help clients deal with sustainability challenges and market requirements.

About Valued Chain

Valued Chain is an independent consultancy. We support organizations in understanding their value chain and stakeholders, identification and mitigation of risks, and realization of opportunities. We believe in integrating commercial objectives with sustainability of the business and its stakeholders. Working from Amsterdam and Lagos, we connect Europe and Africa.