Pathways to Sustainable Growth for Rwanda's Coffee Sector

Feed the Future Africa Great Lakes Region Coffee Support Program (AGLC) Policy Roundtable

March 2017 • Kigali, Rwanda

Roundtable Introduction

AGLC Background

- AGLC is a 3-year USAID-funded initiative that addresses 2 major challenges in the coffee sector in Rwanda (and the Africa Great Lakes region)
  - Reduce antestia bug/potato taste defect (PTD)
  - Raise coffee productivity

- Partners
  - Rwanda: Inst. of Policy Analysis and Research (IPAR) and Univ. of Rwanda (UR)
  - USA: Michigan State University (MSU) and Global Knowledge Initiative (GKI)
  - Numerous public and private sector partners

- Components: • applied research • policy engagement • capacity building

Applied research component

- AGLC draws upon a broad mix of quantitative and qualitative methodologies, including:
  - Coffee farmer/household surveys (and CWS survey)
  - Experimental field/plot level data collection
  - Key Informant Interviews
  - Focus Group Discussions

- Comprehensive coffee sector data base
  - Goal to integrate information from these four data collection activities
  - Provide empirical basis for policy engagement and farmer capacity building

Guiding questions:

- How might we promote the long-term sustainability of Rwanda's coffee sector?

- As a pillar of long-term sustainability, how might we motivate coffee producers to invest more in their plantations?
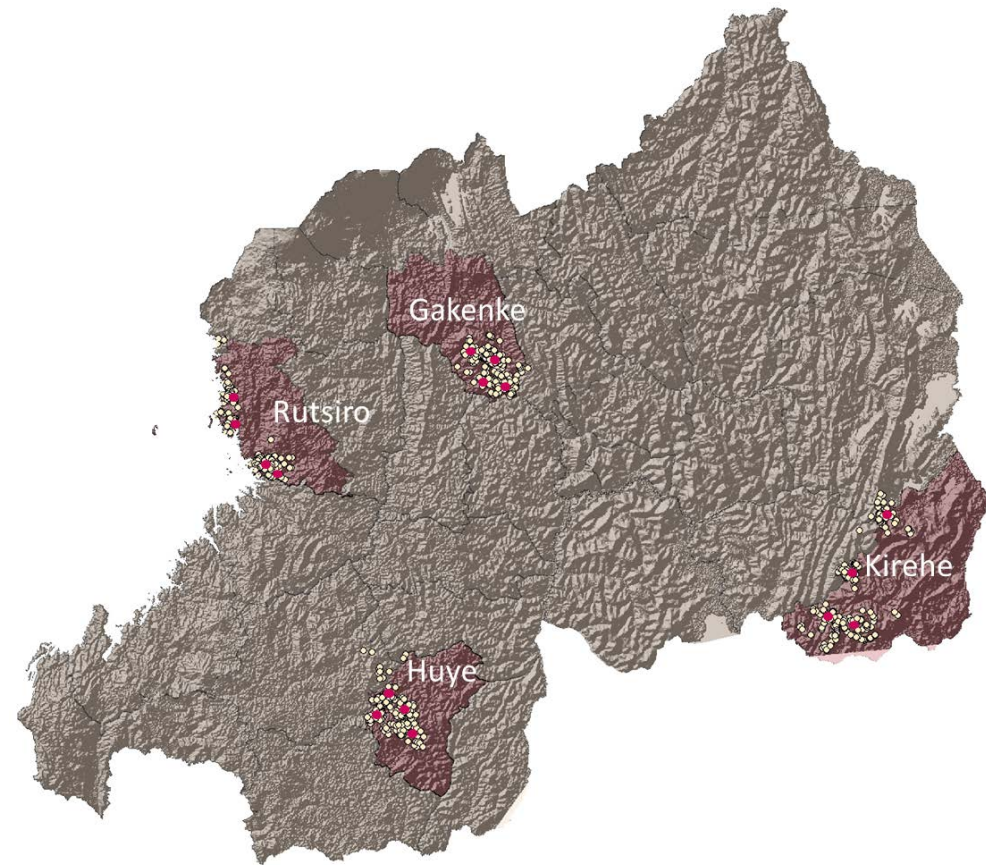
Methodology

Baseline/Midline Survey of coffee growers

- Geographically dispersed sample across four coffee growing districts: Rutsiro, Huye, Kirehe and Gakanke.

- 4 CWSs in each District (2 cooperatives, 2 private)

- 64/32 HHs randomly selected from listings of each of the 16 CWSs
  - Baseline (64 x 16 = 1,024 HHs)
  - Midline   (32 x 16 =   512 HHs)

Baseline & midline survey, cont.

- Focus on fully-washed coffee. Sample does not include HHs not on CWS listings
  - Advantage: In depth focus on core of Rwanda's coffee sector strategy (Fully-washed coffee)
  - Disadvantage: Ordinary coffee (parchment) producers underrepresented

- Survey instrument includes diversity of topics:
  - • coffee growing practices • antestia control practices • cost of production • coffee field characteristics • cherry production & cherry sales • basic household demographics • effects of zoning policy • coffee risk relative to other crops • food security • climate change

- Programmed (in *CSPro*) on 7'' tablets for data collection

- 10 enumerators (working in 2 teams of 5)

Qualitative Data

- Key informant interviews
  - Key coffee sector leaders including public sector representatives, farmer organizations, and private sector stakeholders.
  - Focused on challenges identified by stakeholders and provided insights into critical areas of convergence and disagreement among various specialty coffee sector stakeholder groups.

- Focus group discussions
  - Held with major coffee stakeholder groups including coffee farmers, washing station managers, coffee exporters, others.
  - Groups of 5-7 members of each stakeholder group.

Fieldwork

AGLC Baseline survey interview with farmer in Gakenke

Focus group discussion with farmers at Buf Café washing station

Research Findings

Recap of what we learn from 2015 findings

1. Low and stagnating coffee production coming up short of our targets for growth

2. Producer prices 25-30% below other coffee producing countries in the region

3. Lower productivity (Kg/tree) than others in the region

4. Cost of production is high relative to returns so that a large proportion of growers suffer net losses in coffee.

5. Incentives and capacity diffs among larger and smaller producers

6. Importance of prices and price stability for farmer investment in higher production and productivity

7. Low farmer investment has contributed weak and old trees yielding low quality coffee and has invited antestia/PTD

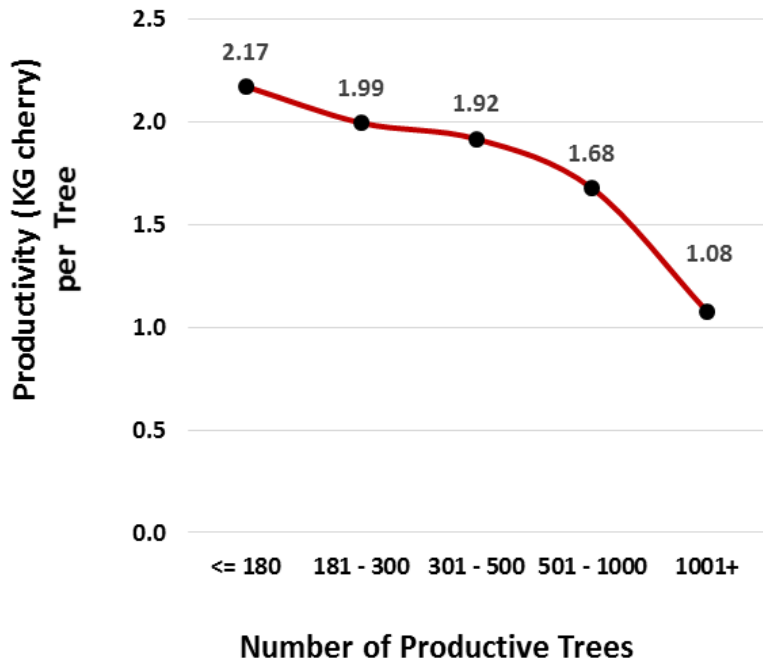# Farmer investments in coffee (per tree)

Value (RWF) of Household Investments in Coffee Production per Tree (HH Labor, Wage Labor & Purchased Inputs) by Number of Trees on Farm
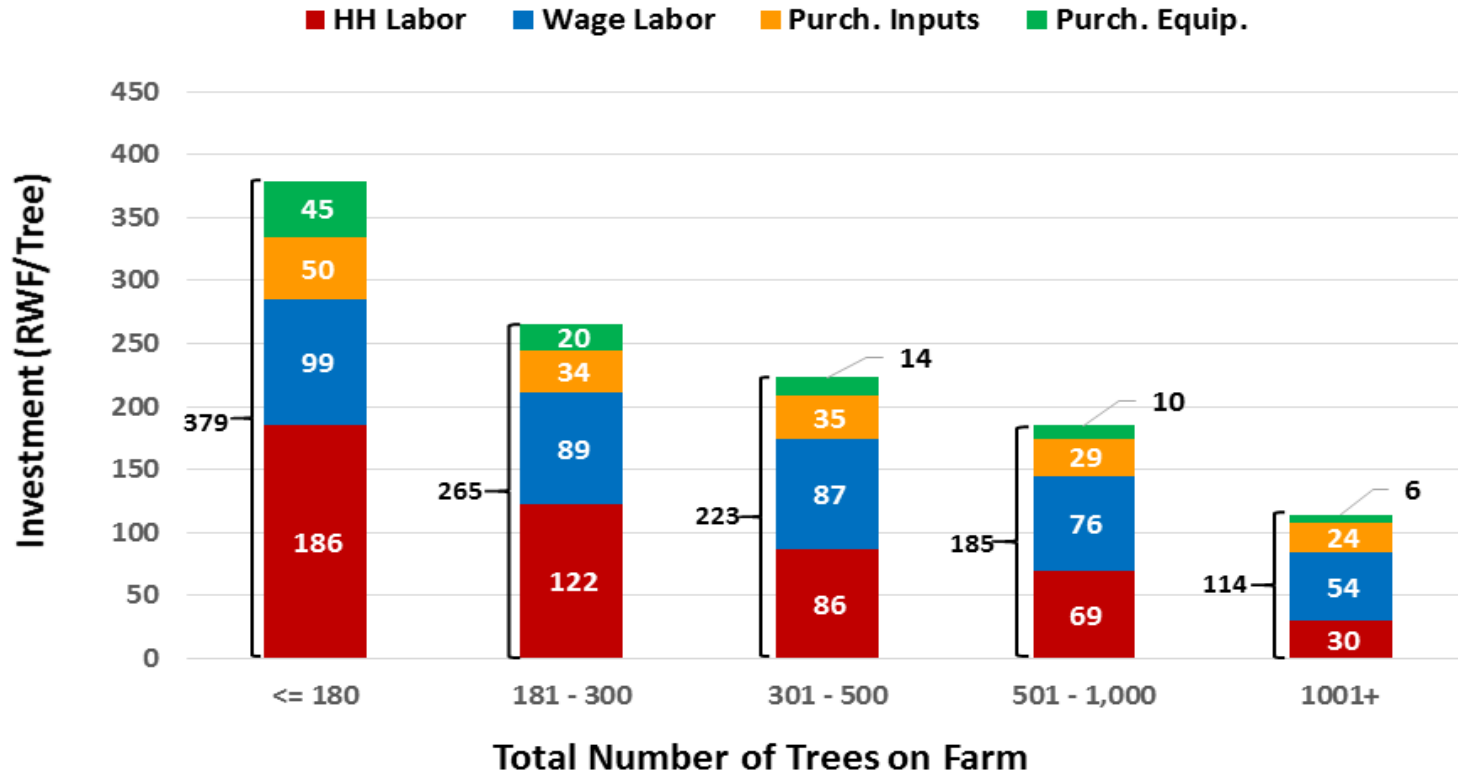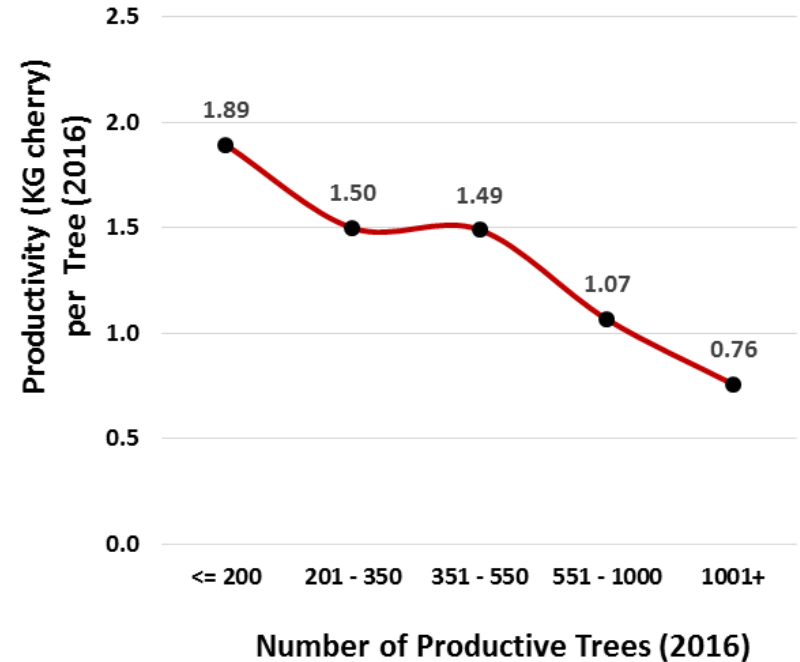
Productivity

2015

Mean Productivity (KG cherry) per Tree by Number of Trees on Farm (ANOVA)

2016

Mean Productivity (KG cherry) per Tree by Number of Trees on Farm in 2016 (ANOVA)

Gross margins (profits)

2015

Mean Gross Margin* (RWF) per KG of Cherry by Number of Trees on Farm (ANOVA)

*Gross Margin = Value of Sales - Cost of production & transport

2016*

Mean Gross Margin* (RWF) per KG of Cherry by Number of Trees on Farm (ANOVA)

*Gross Margin = Value of Sales - Cost of production & transport
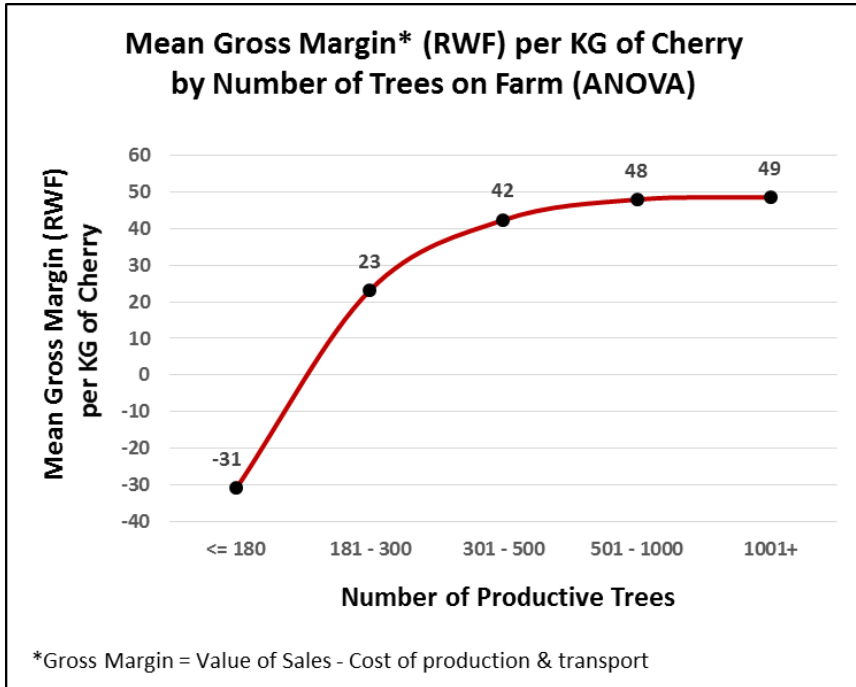
*2016 gross margin based on 2015 costs to harvest cherry which are likely higher than actual cost due to ~23% lower production in 2016.

Rwanda Coffee Farmer Typology: Capacity to Invest versus Incentive to Invest (*in Low Cherry Price Scenario*) by Size of Plantation

Incentive to Invest

Capacity to Invest

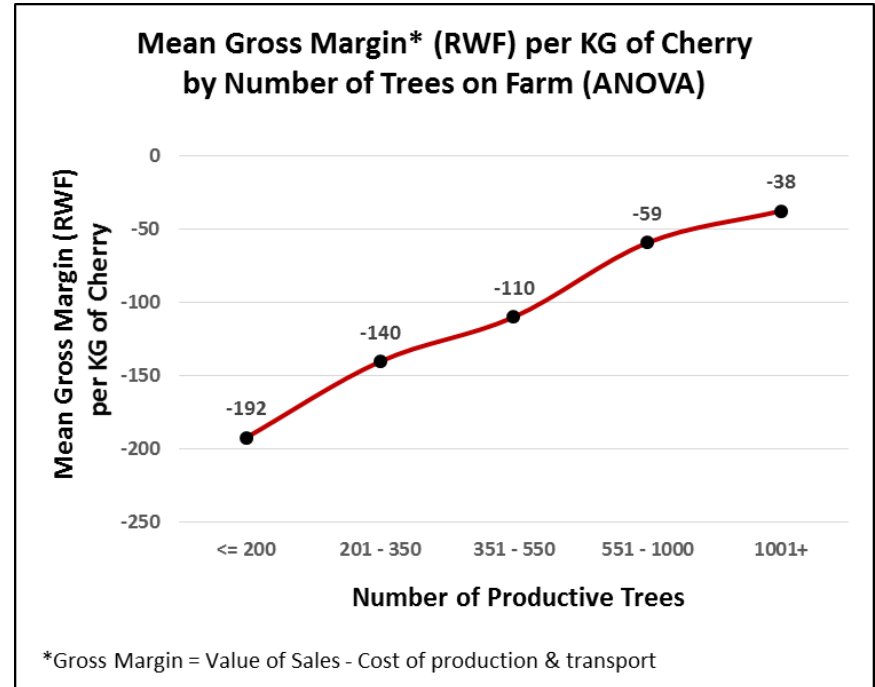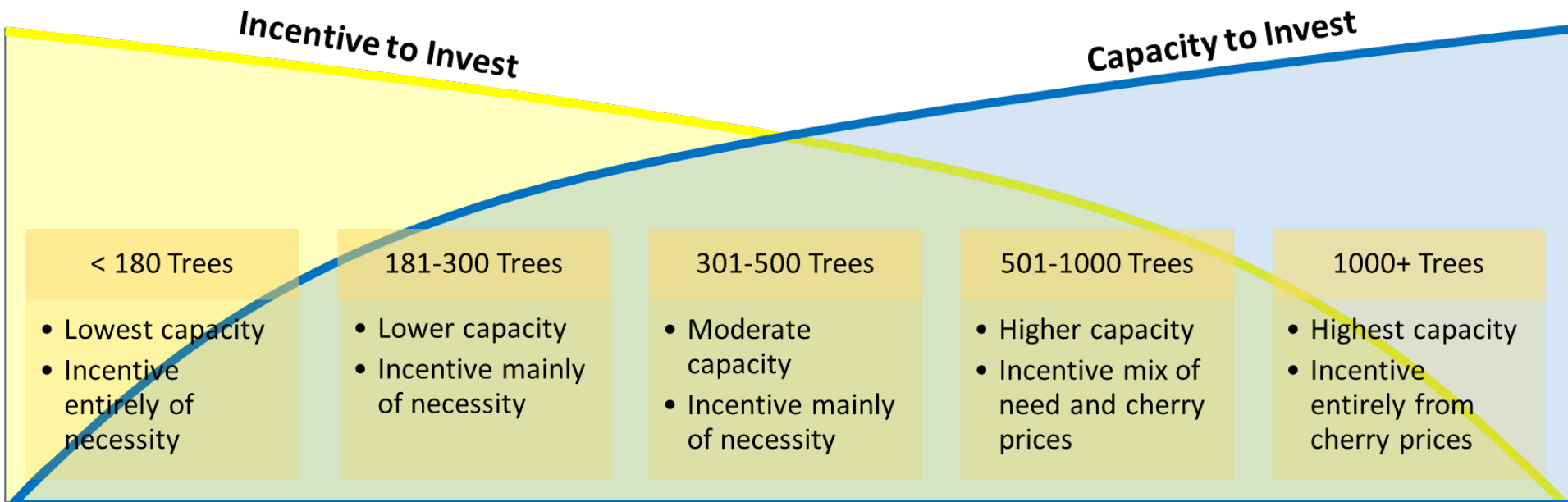| < 180 Trees	181-300 Trees	301-500 Trees	501-1000 Trees	1000+ Trees
• Lowest capacity • Incentive entirely of necessity	• Lower capacity • Incentive mainly of necessity	• Moderate capacity • Incentive mainly of necessity	• Higher capacity • Incentive mix of need and cherry prices	• Highest capacity • Incentive entirely from cherry prices

1 **Smallholder Producer**
• High Productivity
• Low Profits

2 **Mid-range Producer**
• Medium Productivity
• Higher Profits

3 **Largeholder Producer**
• Low Productivity
• Low Profits

Productivity (Kg/Tree) and Number of Trees by Level of Coffee Investment Capacity (Composite Index)
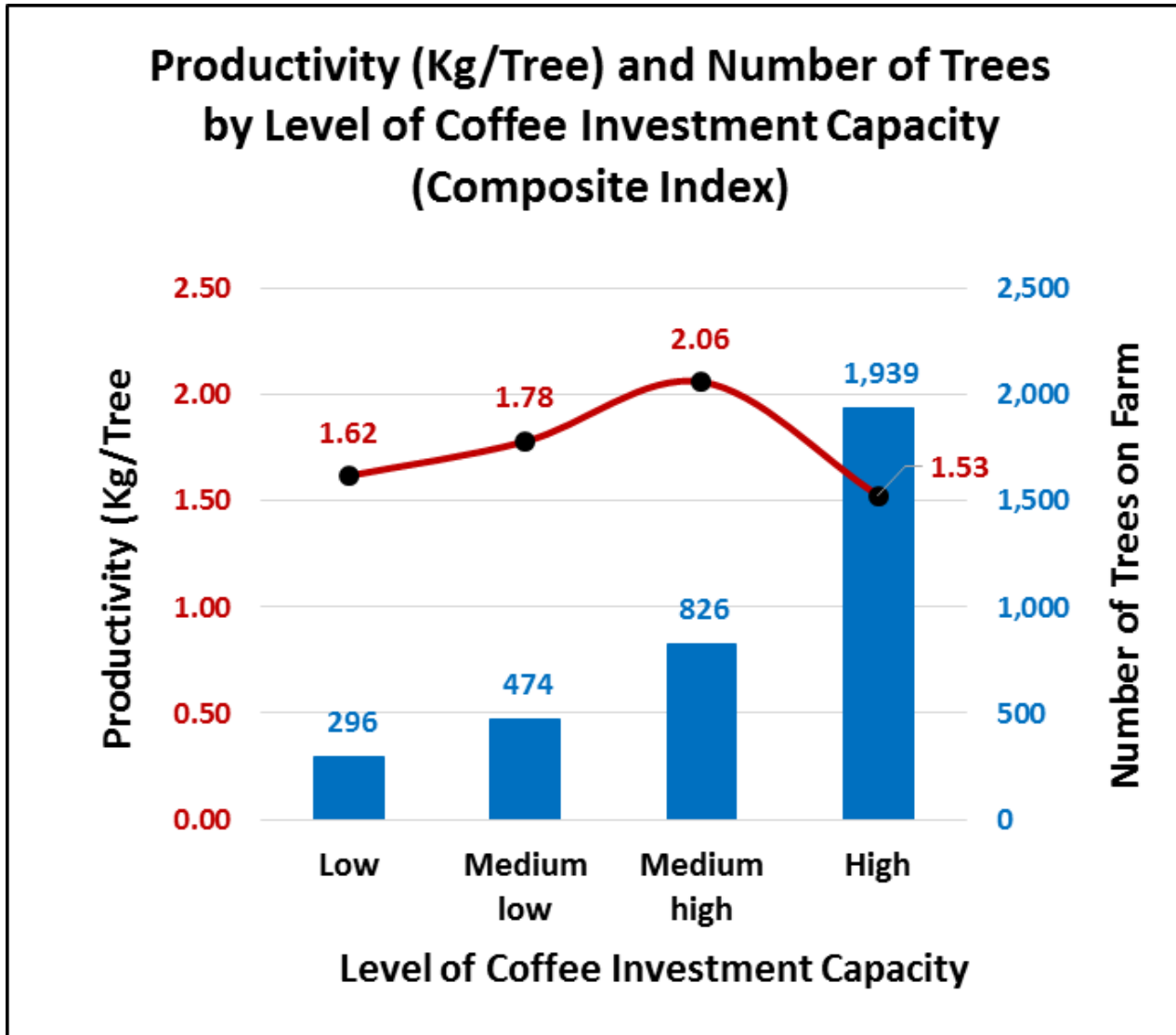
Low and unstable cherry prices reported as the most important barriers to investment in coffee

Primary Barriers to Investment in Coffee Identifed by Coffee Growing Households

Barriers to Investment in Coffee:
- Low cherry prices — 71%
- Unstable cherry prices — 46%
- Lack of inputs distribution — 35%
- High labor requirements — 28%
- High cost of inputs — 19%
- Access to mulch — 16%

Percent of Households Identifying Barrier
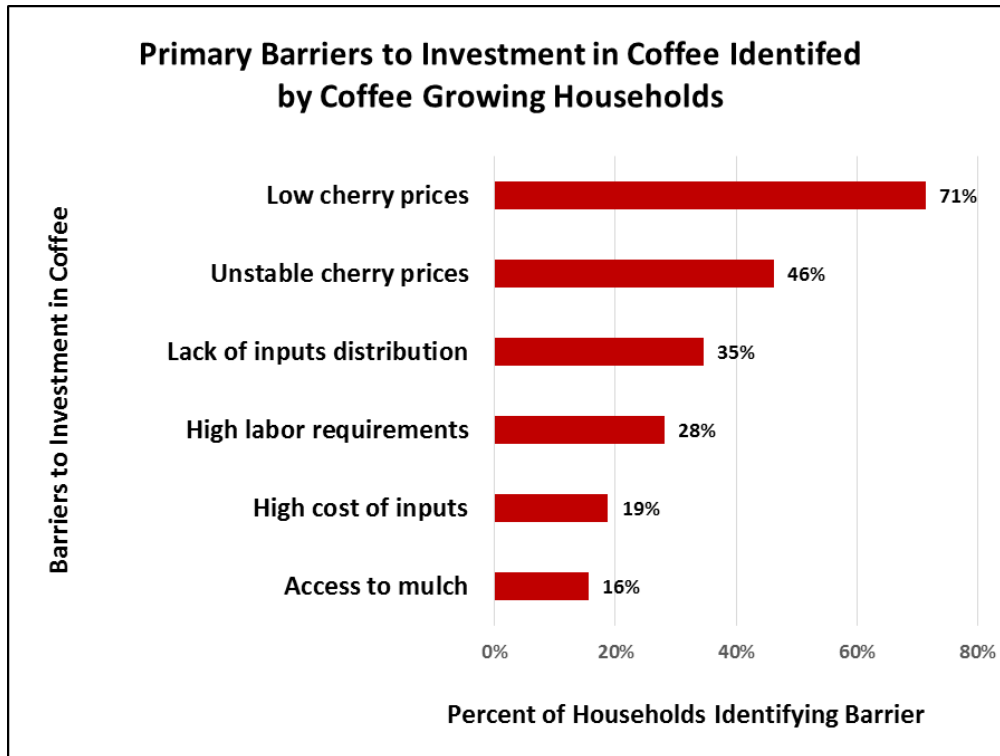
Low and Unstable Cherry Prices Reported by Farmers as Barriers to Investment in Coffee by Number of Trees on Farm

Trees on farm	Low cherry prices are a barrier to investment	Unstable cherry prices are a barrier to investment	N
<= 180	67.0%	45.4%	194
181 - 300	66.2%	44.9%	198
301 - 500	75.1%	44.2%	233
501 - 1,000	72.1%	46.6%	208
1001+	76.3%	51.1%	186
Total	71.4%	46.3%	1,019
Sig. (Chi Sq)	*0.080*	*0.674*	

Premium Payments to Farmers in 2015 and 2016

Payments and productivity		2015	2016
Promised premium	% "Yes"	31.4%	68.8%
Received premium	% "Yes"	26.8%	35.4%
	N	1,016	512
Premium received (RWF/Kg)	Mean	16.4	21.9
	Median	15.0	20.0
Premium received (Total RWF)	Mean	11,721	23,431
	Median	7,000	10,000
	N*	274	181
Cherry prices received by farmers	Mean	198	172
	Median	200	160
	N	1,022	502
Increase in productivity (Kg/tree) associated with premium (ANOVA)	%	29.2%	8.2%
	N	1,016	510

*Among those receiving a premium

Observations on the long-term sustainability of Rwanda's coffee sector

1. Coffee sector cannot be sustainable unless producers are motivated to invest in their plantations.

2. Coffee prices and bonuses (and their stability) are by far the most important incentives to farmer investment.

3. Coffee value chain is fragile and risks collapse if steps are not taken to support producers and to bring in a younger generation of coffee farmers.

4. Needs much public and private sector support.

How might we promote the long-term sustainability of Rwanda's coffee sector?

- There are many priorities in Rwanda agriculture but coffee is not high on the list
  - Coffee is given secondary status in the *Rwanda National Agriculture Policy 2030,*
  - *MINAGRI Strategic Plan (PSTA III)*
  - *Project for Rural Income through Exports (PRICE)*
- Focus on building capacity (production side) with no mention of incentives
- It is not a CIP crop so does not receive that level of investment from public resources.
- Coffee is not given the level of policy attention given to other crops
- But it should be…

Why should coffee be a top national priority for Rwanda?

1. For many reasons:
    - Agronomic
    - Economic
    - Environmental
    - Socio-cultural

2. Comparatively, few crops in Rwanda hold the breadth of importance or long-term potential of coffee

3. A closer look as some of them…

Reason #1. Coffee is historically Rwanda's top source of export earnings and economic growth

- Production tradition and know-how
- Processing infrastructure
- Institutional capacity
- But its importance is declining

Coffee as a Percent of Total Exports in Rwanda (2010-2016)
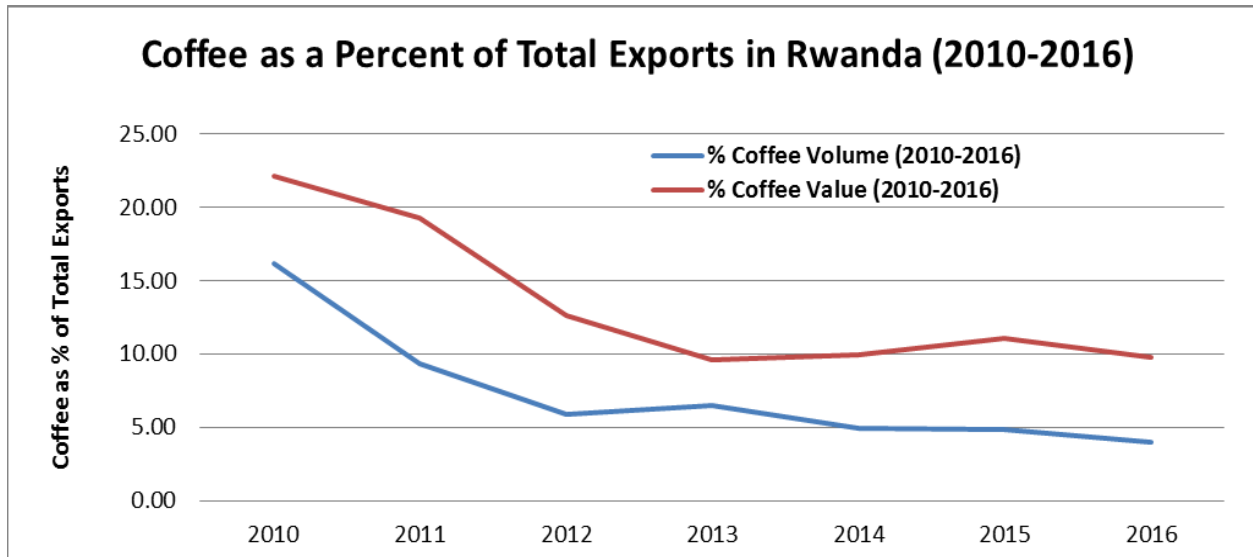
Reason #2. Coffee affects over 450,000 farmers and their families.

- Major source of income for producers

Percent of Household Income from Coffee by District

District	Percent of Income from Coffee
Huye	51.3
Rutsiro	44.6
Kirehe	40.8
Gakenke	41.3
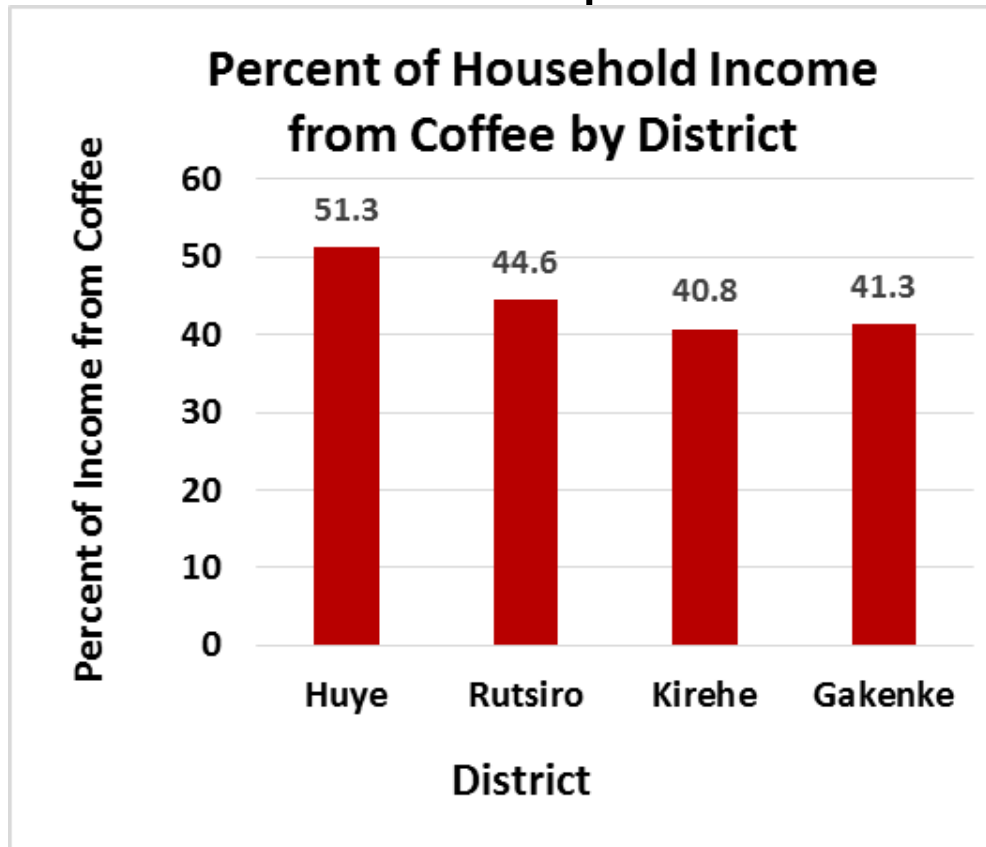
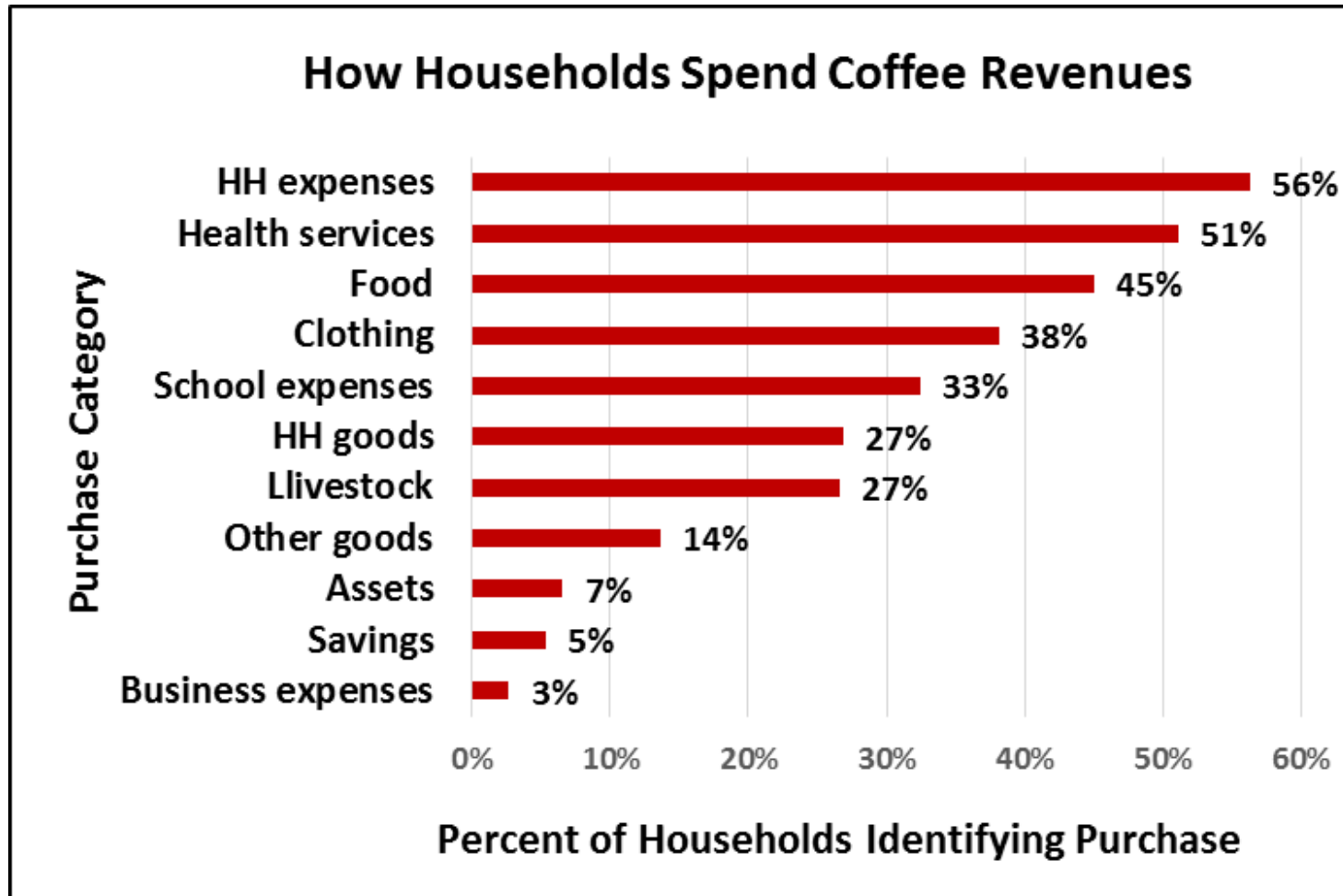# Coffee income used for vital goods & services...

How Households Spend Coffee Revenues

Purchase Category	Percent
HH expenses	56%
Health services	51%
Food	45%
Clothing	38%
School expenses	33%
HH goods	27%
Llivestock	27%
Other goods	14%
Assets	7%
Savings	5%
Business expenses	3%

Percent of Households Identifying Purchase
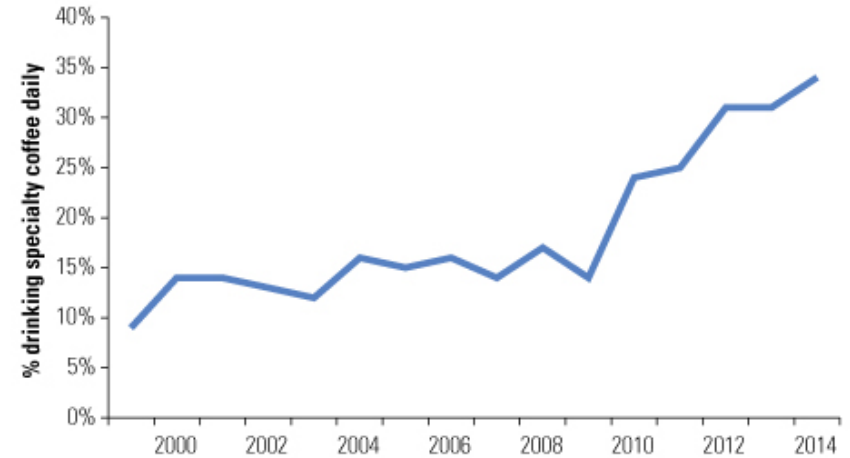
Reason #3. Specialty coffee is in high and growing demand worldwide

U.S. Coffee Imports
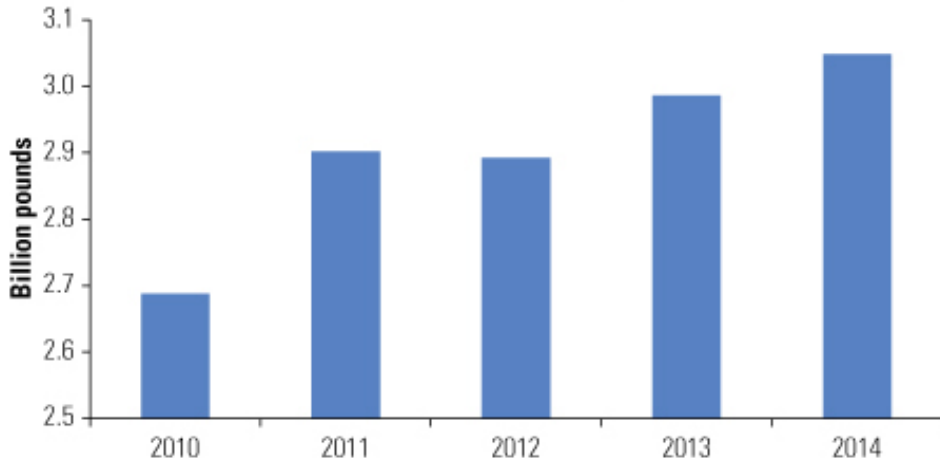
Source: International Trade Center.

U.S. Adult Specialty Coffee Consumption

Source: National Coffee Association.

Reason #4. Specialty coffee has price stability in international markets (compared to ordinary)

- Given the premium value, specialty growers can be somewhat insulated from price fluctuations

- African specialty coffee is becoming "decoupled" from the NY C price

C Price vs. African Specialty Coffee

Weighted Average Sales Price/lb. of African Specialty Coffee — Average C Price
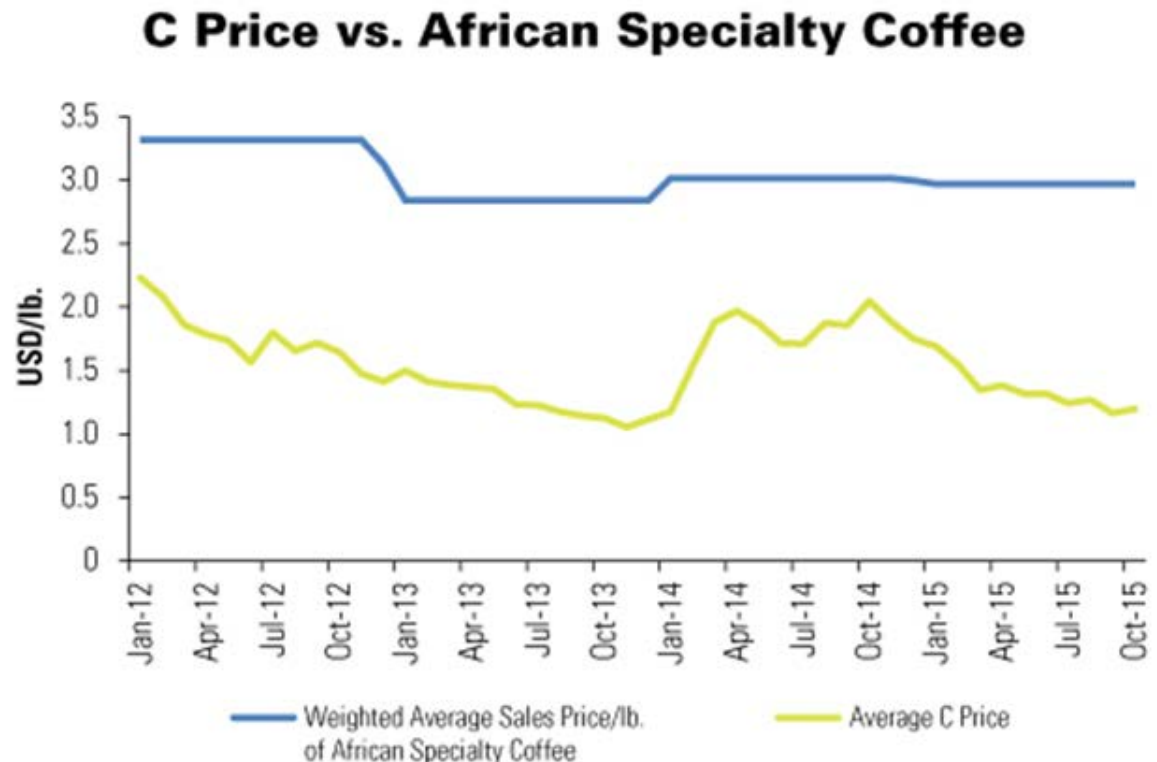
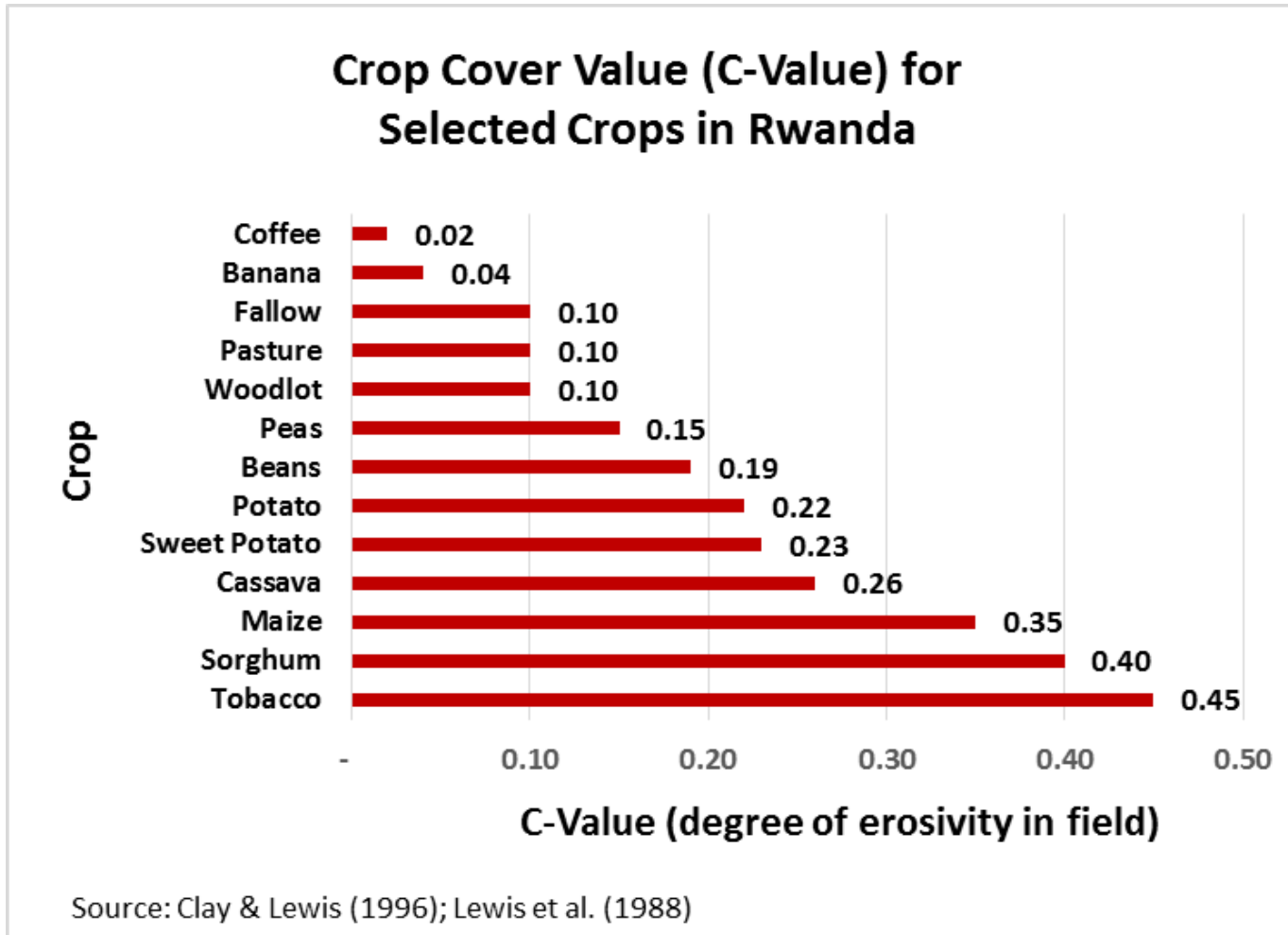Source: Westrock Coffee.

Reason #5. Rwanda has international comparative advantage in specialty coffee

- Ideal agroecology for growing coffee:
  - High elevation mountain agriculture
  - Tropical climate with good rainfall
  - Good soils
  - Source of prized Bourbon varieties
- Labor availability
- Strong market appeal
  - History and compelling story
  - Cooperative tradition
  - Smallholder farmers

Reason #6. Environmentally superior to most other crops

- Grows well on steep hillsides
- Mulching decomposition adds needed organic matter to soils
- Does not need expensive terraces (a major cost savings)
- Coffee controls soil erosion better than any other crop
  - Root structure
  - Canopy
  - No exposed soils due to tillage
  - Heavily mulched
  - Combined, these factors bring low erosivity…

Coffee has exceptionally low erosivity

Crop Cover Value (C-Value) for Selected Crops in Rwanda

Crop	C-Value
Coffee	0.02
Banana	0.04
Fallow	0.10
Pasture	0.10
Woodlot	0.10
Peas	0.15
Beans	0.19
Potato	0.22
Sweet Potato	0.23
Cassava	0.26
Maize	0.35
Sorghum	0.40
Tobacco	0.45

C-Value (degree of erosivity in field)

Source: Clay & Lewis (1996); Lewis et al. (1988)

Coffee's low erosivity eliminates the need for high-cost bench terrace construction and maintenance in steep slopes

- Cost per hectare to construct bench terraces: 2500-3000 US$*

- Annual maintenance cost per hectare for bench terraces: ~150 $US

- 91,000 Ha constructed (2012-2016), 37,5% of land suitable for terraces

- Construction costs largely subsidized through government programs (MINAGRI)

*Source: A R Bizoza, J B Nkurikiye, P Byishimo. Farmers' Perspectives of Climate Change Adaption and Resilience in Rwanda, *Administratio Publica*, Vol 24 No 4 December 2016.

Tea plantation in Rwanda on slopes that would otherwise be terraced
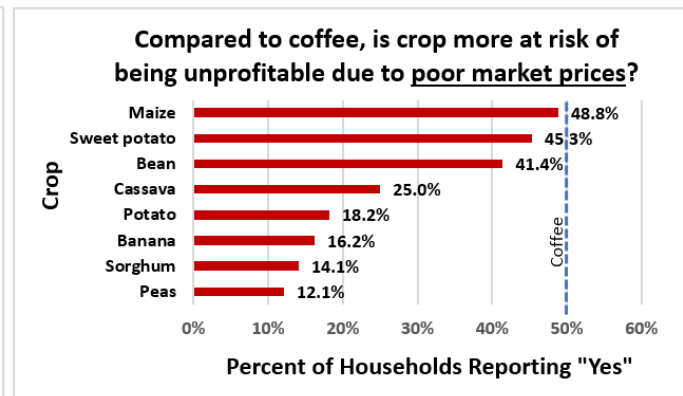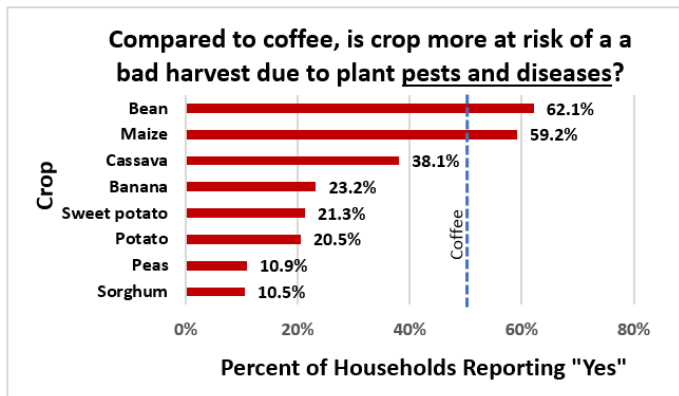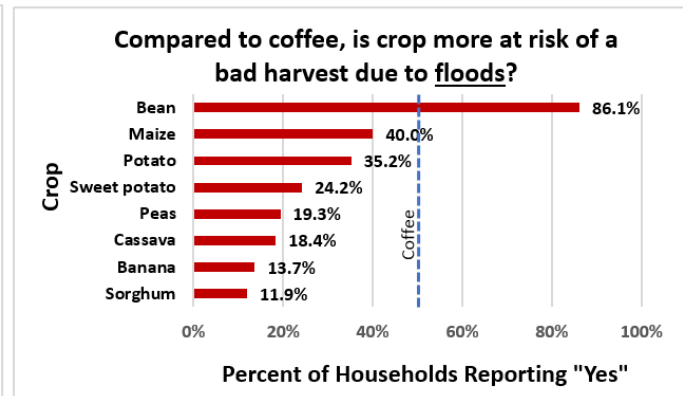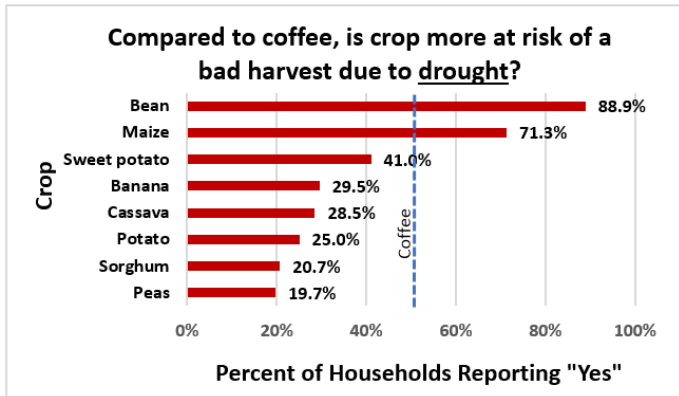
Coffee plantation in Brazil on slopes that would otherwise be terraced

- Typical steep hillsides in Rwanda that need either terraces or coffee (or tea or fruit trees) to be sustainable in the long term.

- Coffee may be the best option for many.

- It will take a concerted effort by the stakeholders in the coffee value chain to realize such a vision.

- It will also require motivated farmers.

Reason #7. Coffee is less vulnerable to risks of droughts, floods, and pests/diseases compared to several other priority crops.

Compared to coffee, is crop more at risk of a bad harvest due to drought?

Crop	Percent of Households Reporting "Yes"
Bean	88.9%
Maize	71.3%
Sweet potato	41.0%
Banana	29.5%
Cassava	28.5%
Potato	25.0%
Sorghum	20.7%
Peas	19.7%

Compared to coffee, is crop more at risk of a bad harvest due to floods?

Crop	Percent of Households Reporting "Yes"
Bean	86.1%
Maize	40.0%
Potato	35.2%
Sweet potato	24.2%
Peas	19.3%
Cassava	18.4%
Banana	13.7%
Sorghum	11.9%

Compared to coffee, is crop more at risk of a a bad harvest due to plant pests and diseases?

Crop	Percent of Households Reporting "Yes"
Bean	62.1%
Maize	59.2%
Cassava	38.1%
Banana	23.2%
Sweet potato	21.3%
Potato	20.5%
Peas	10.9%
Sorghum	10.5%

Compared to coffee, is crop more at risk of being unprofitable due to poor market prices?

Crop	Percent of Households Reporting "Yes"
Maize	48.8%
Sweet potato	45.3%
Bean	41.4%
Cassava	25.0%
Potato	18.2%
Banana	16.2%
Sorghum	14.1%
Peas	12.1%

Reason #8. Dedicated coffee producing households have better food security

Logistic Regression Model: Household Experienced Long-term Food Shortfall (> 1 month) by Coffee Income Share and Selected Covariates

Regressors	B	S.E.	Wald	df	Sig.	Exp(B)	Inverse Odds Ratio‡
Coffee share (%) of total HH Income	-1.077	0.421	6.524	1	0.011**	0.341	2.93
Member of coop	-0.289	0.200	2.085	1	0.149	0.749	1.34
Total land owned (Ha)	-0.297	0.110	7.325	1	0.007***	0.743	1.35
Income 2015 (not including coffee)	0.000	0.000	3.884	1	0.049**	1.000	1.00
Gender of HH head	0.866	0.265	10.680	1	0.001***	2.377	-
Age of HH head	0.000	0.010	0.000	1	0.994	1.000	-
Active adults in HH	0.081	0.066	1.511	1	0.219	1.084	-
Education of HH head	-0.209	0.096	4.776	1	0.029**	0.811	1.23
Years growing coffee	0.011	0.009	1.477	1	0.224	1.012	-
Elevation of HH (m)	0.000	0.001	0.268	1	0.605	1.000	1.00
Constant	0.608	1.182	0.265	1	0.607	1.837	-

*, **, *** indicates significance at the 10%, 5% and 1% levels, respectively.

‡ For ease of interpretation inverse odds ratio computed for covariates with negative log odds (B).

N=508 housholds

35

Summary & discussion points

Recap of challenge and findings

1. Long-term success of the coffee sector (all stakeholders) depends on growth in production and productivity

2. Farmer investment in productivity is the critical factor

3. Farmer incentives to invest are the key to higher investment and productivity

4. Coffee is stagnant and vulnerable but has high potential for long term growth and sustainability due to:
   - Trends in specialty coffee markets are promising (growing and becoming detached from NY C price)
   - Exceptional comparative advantage based on agronomic, economic, environmental and socio-cultural factors

5. Despite vulnerability and potential, coffee has not received the level of policy attention needed to be successful in the long term

Discussion questions

1. What else do we conclude from the data?

2. What are the major policy levers that can help motivate farmers to invest in coffee?

3. What steps can be taken to elevate coffee in our strategic thinking and actions?

   • How to best communicate the importance and potential of coffee (the 8 points)?

4. Are there specific actions that can be taken to provide incentives for farmers to invest?

   • When to set and announce cherry prices?

   • How to stabilize cherry prices from year to year?

   • How to better use media to inform and engage farmers?

5. How can we better articulate the challenge and what else do we need to know?

Thank You!