



COLUMBIA | SIPA

School of International and Public Affairs

Value Chain Analysis

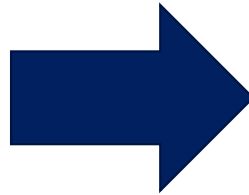
Guest lecture by Carl Cervone

March 21, 2023

Coffee: the value chain from farm to cup



\$4/kilo

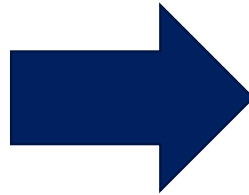


\$4/cup

Coffee: the value chain from farm to cup



\$4/kilo



\$4/cup
\$5/cup

My background



Education: BS in Environmental Science, MBA



2004: Moved to Tanzania to work in microfinance



2006: Started work in coffee sector at TechnoServe



2016: Cofounded Enveritas



2023: Working on a new startup



Connect: <https://www.linkedin.com/in/carlcervone>

Plan for today

- The Coffee Value Chain
- The Value Chain Framework
- Case Study: Vietnam
- Case Study: Colombia

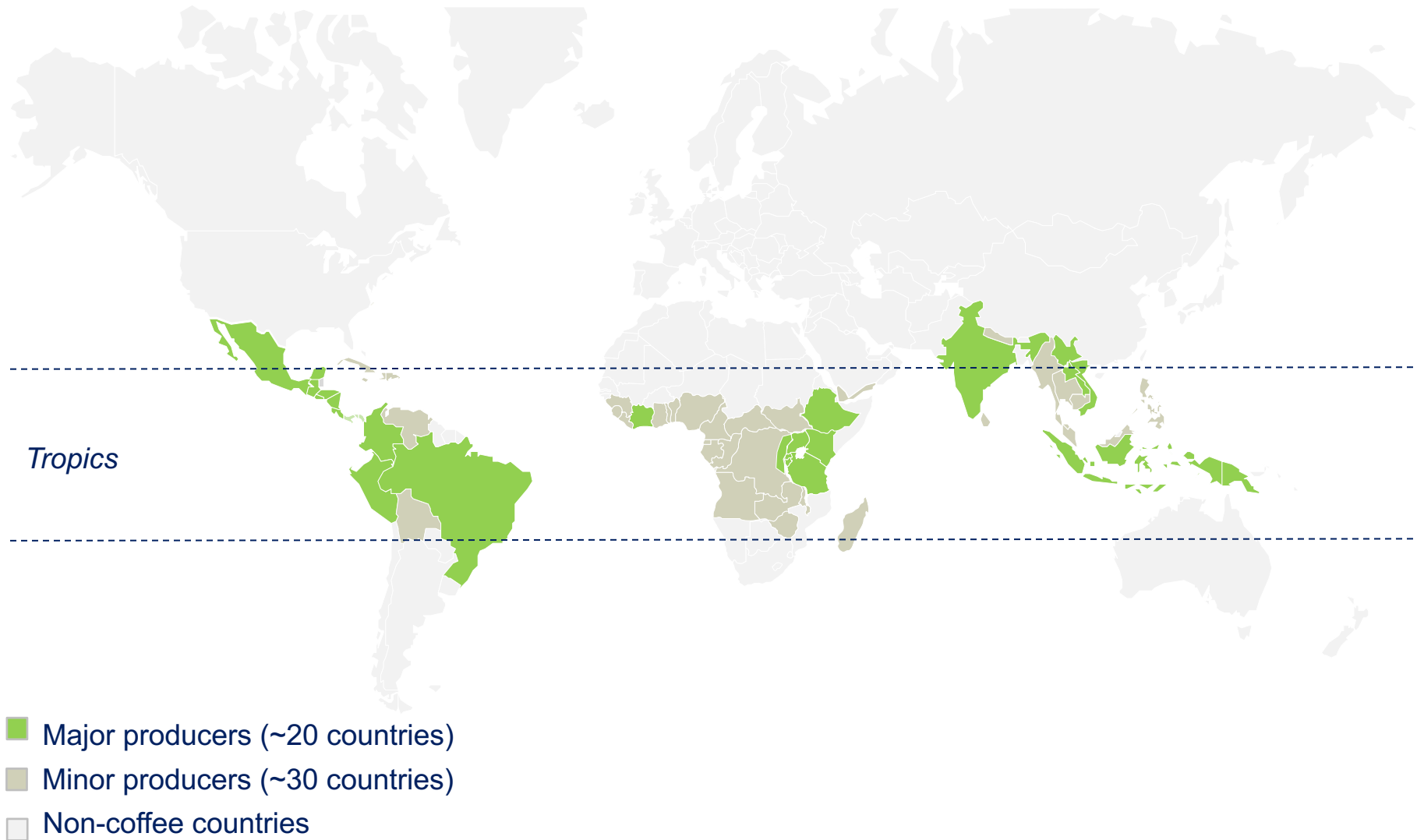
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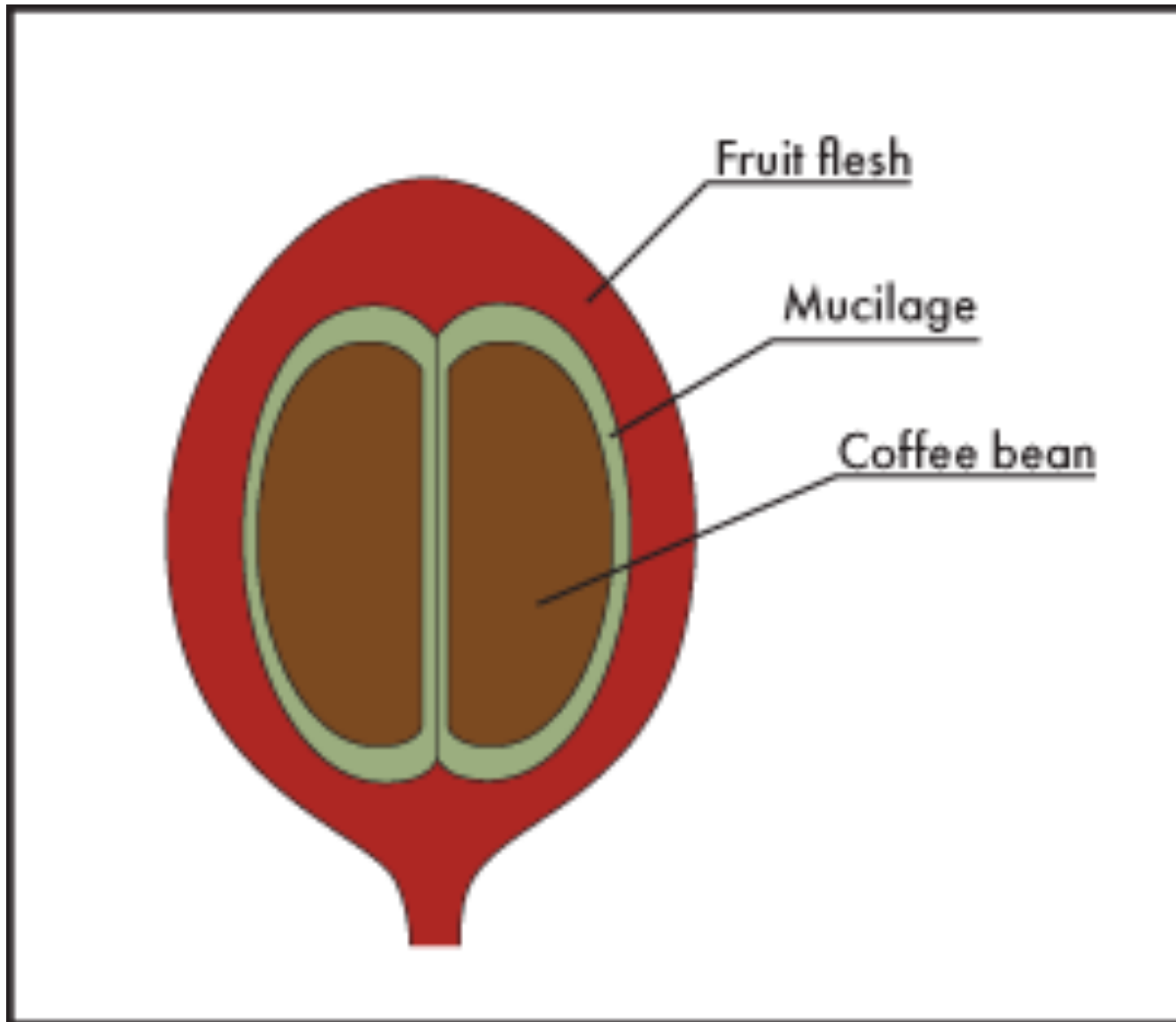
Coffee is a fruit that grows on trees



Coffee trees require a tropical climate



The coffee “bean” is the seed inside the fruit



The coffee value chain from cherry to cup

Cherry



Parchment



Green



Roasted



Ground



Cup



>95% of the world's coffee farms are “smallholders”

Cherry



There are some very large, industrial coffee farms

Cherry



On small farms, coffee cherries are harvested by hand

Cherry



Coffee should be processed immediately after picking

Cherry



Cherries are de-pulped...

Parchment



... washed ...

Parchment



... and dried

Parchment



Large mills process coffee for export



Green



Exportable coffee is bagged and loaded in containers



Coffees are blended and roasted to different profiles

Roasted



Coffee is ground, packaged, and vacuum-sealed

Ground



Water is added – and it's ready to drink!



Cup



Each stage of the value chain involves different actors



Natural and logistical factors make it difficult to occupy more than 1-2 roles in the overall value chain



Today, we will focus on the first three stages of the value chain only

Cherry	Parchment	Green	Roasted	Ground	Cup
					
>10 M farms	<1 M mills	< 0.01 M traders	< 0.1 M roasters	>1 M retailers	>1000 M consumers

Plan for today

- The Coffee Value Chain
- **The Value Chain Framework**
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Three important steps in any Value Chain Analysis

1

MAP

- who the relevant actors are
- what they do
- how they relate to each other

2

BREAKDOWN

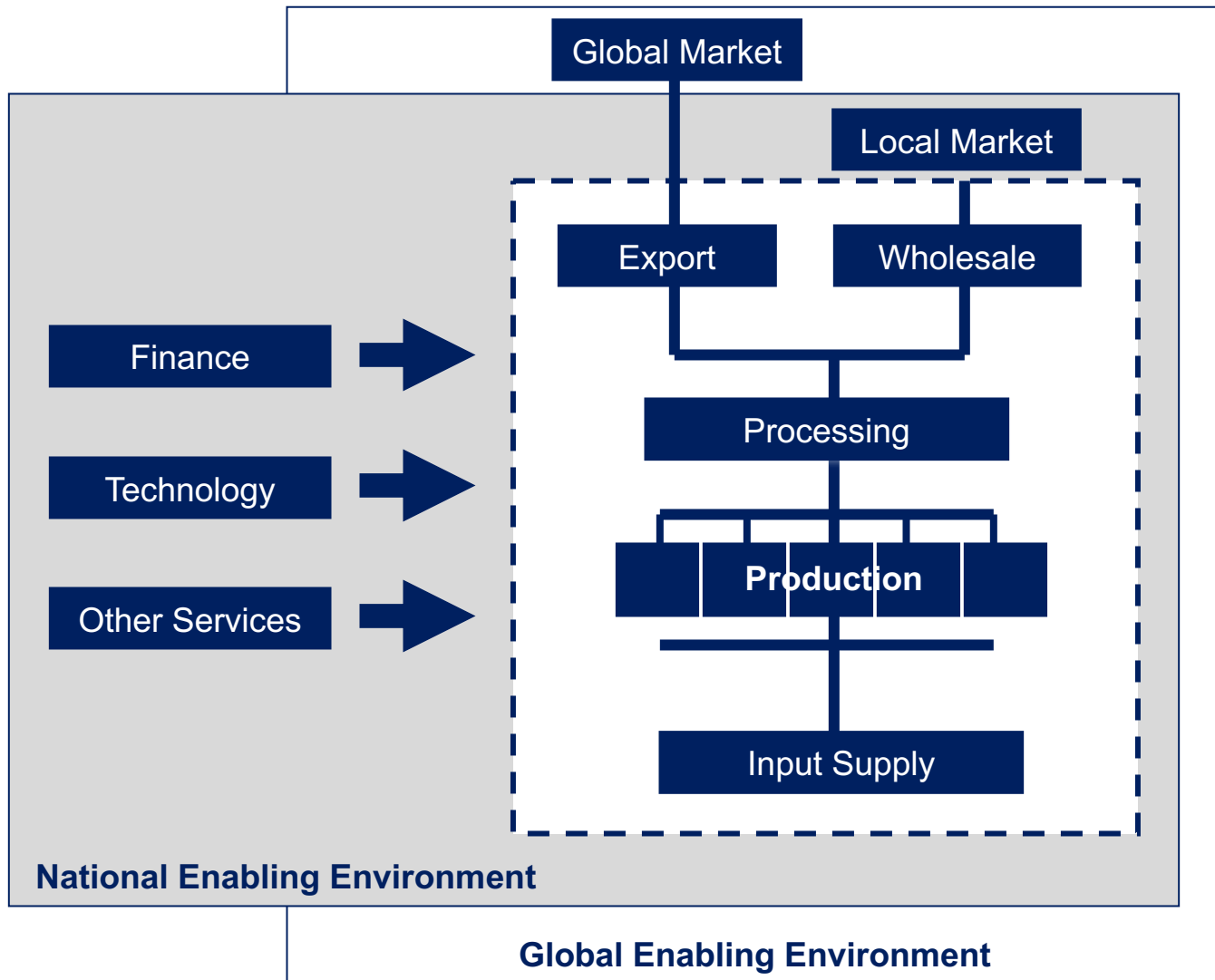
- costs and revenues for each actor
- how value flows through the chain

3

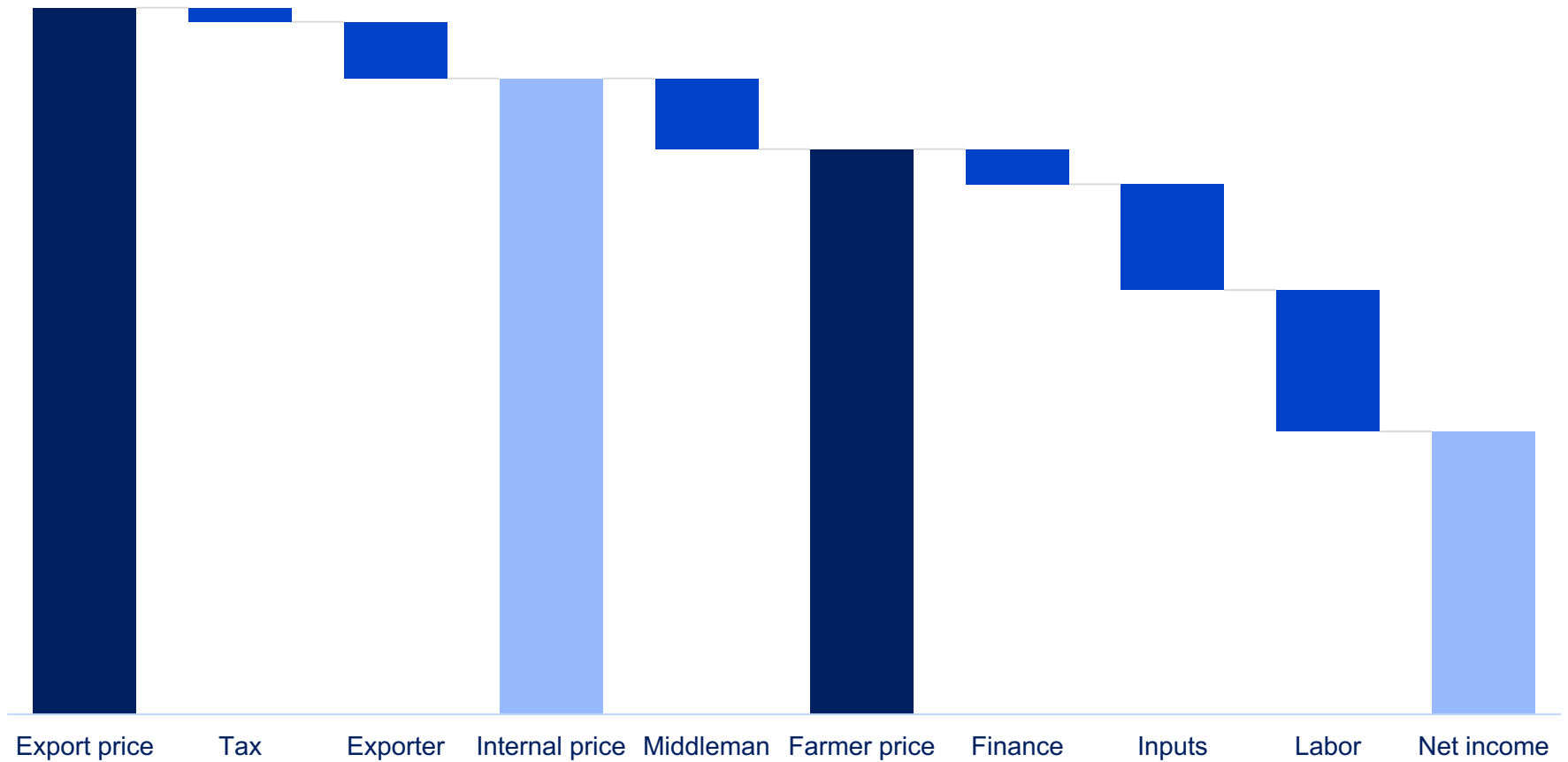
BENCHMARK

- performance of the value chain against peer countries or sectors
- use data to justify recommendations

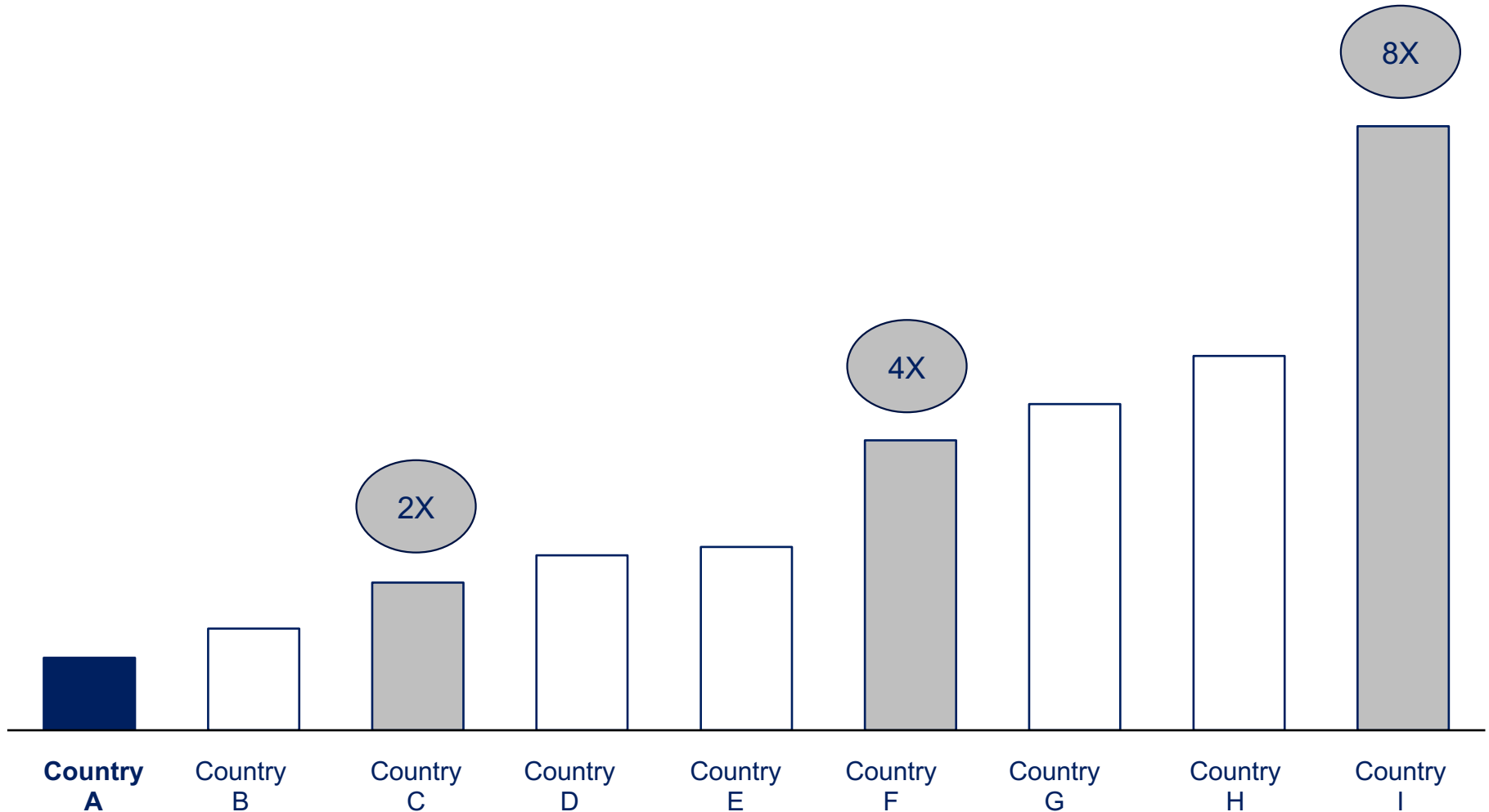
Map who the relevant actors are, what they do, how they relate to each other



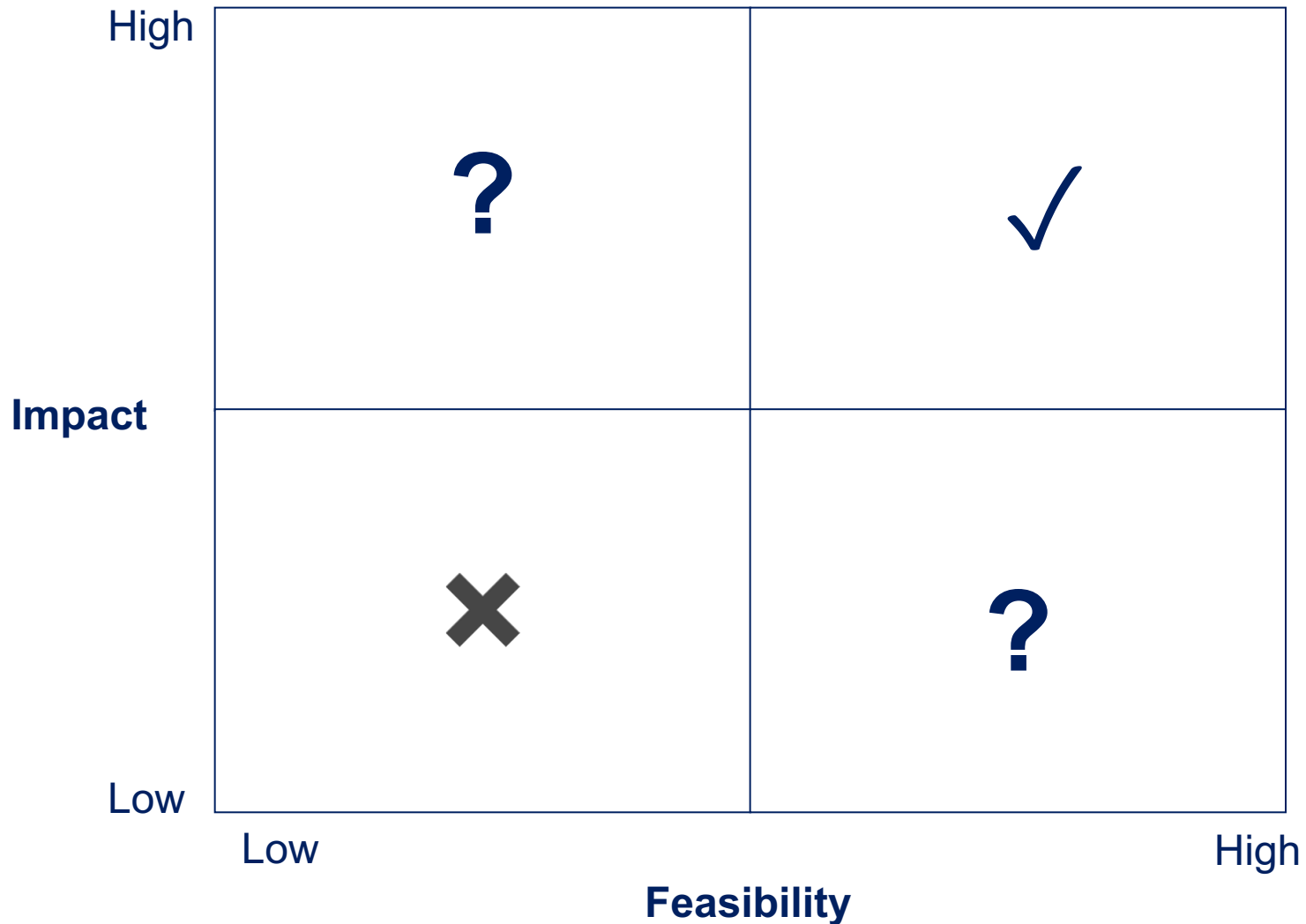
Breakdown costs and revenues for each actor, how value flows through the chain



Benchmark performance of the value chain against peer countries or sectors



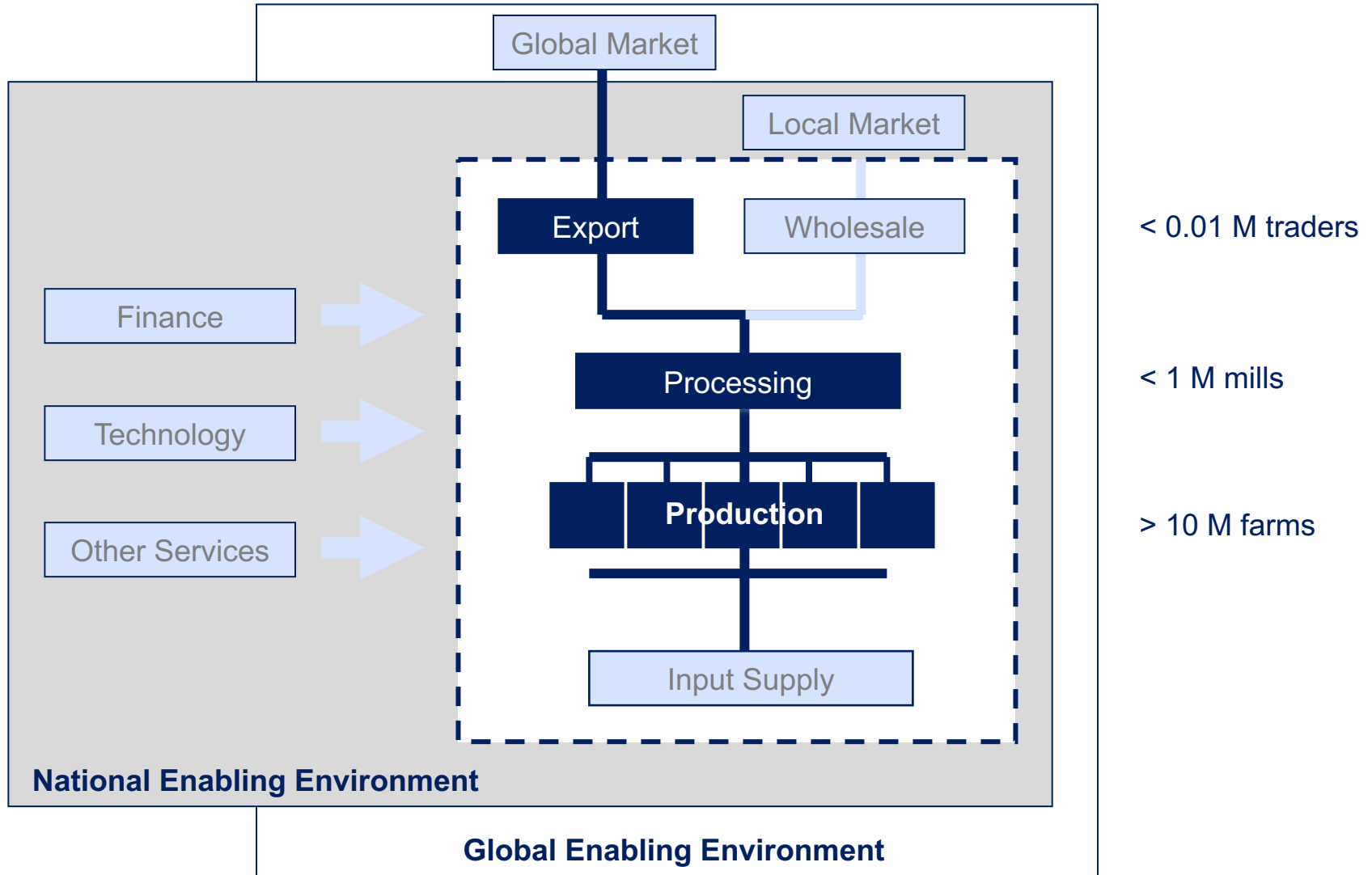
After analysis, **prioritize** recommendations (based on some pre-defined selection criteria)



Applying these concepts to the Coffee Value Chain

Cherry	Parchment	Green	Roasted	Ground	Cup
					
>10 M farms	<1 M mills	< 0.01 M traders	< 0.1 M roasters	>1 M retailers	>1000 M consumers

Global coffee value chain map



Breakdown costs and revenues for each actor, how value flows through the chain

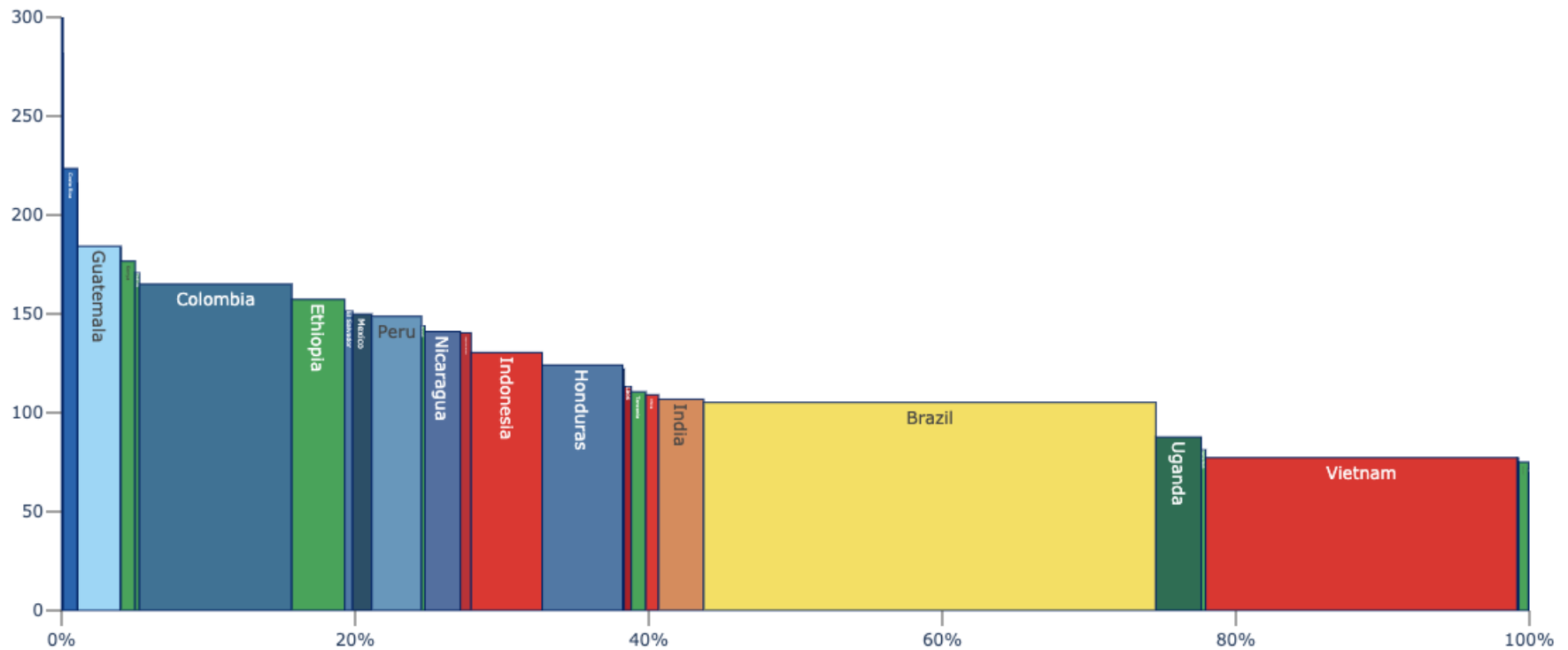
← Usually, this is the easiest place to start because you can find public export data



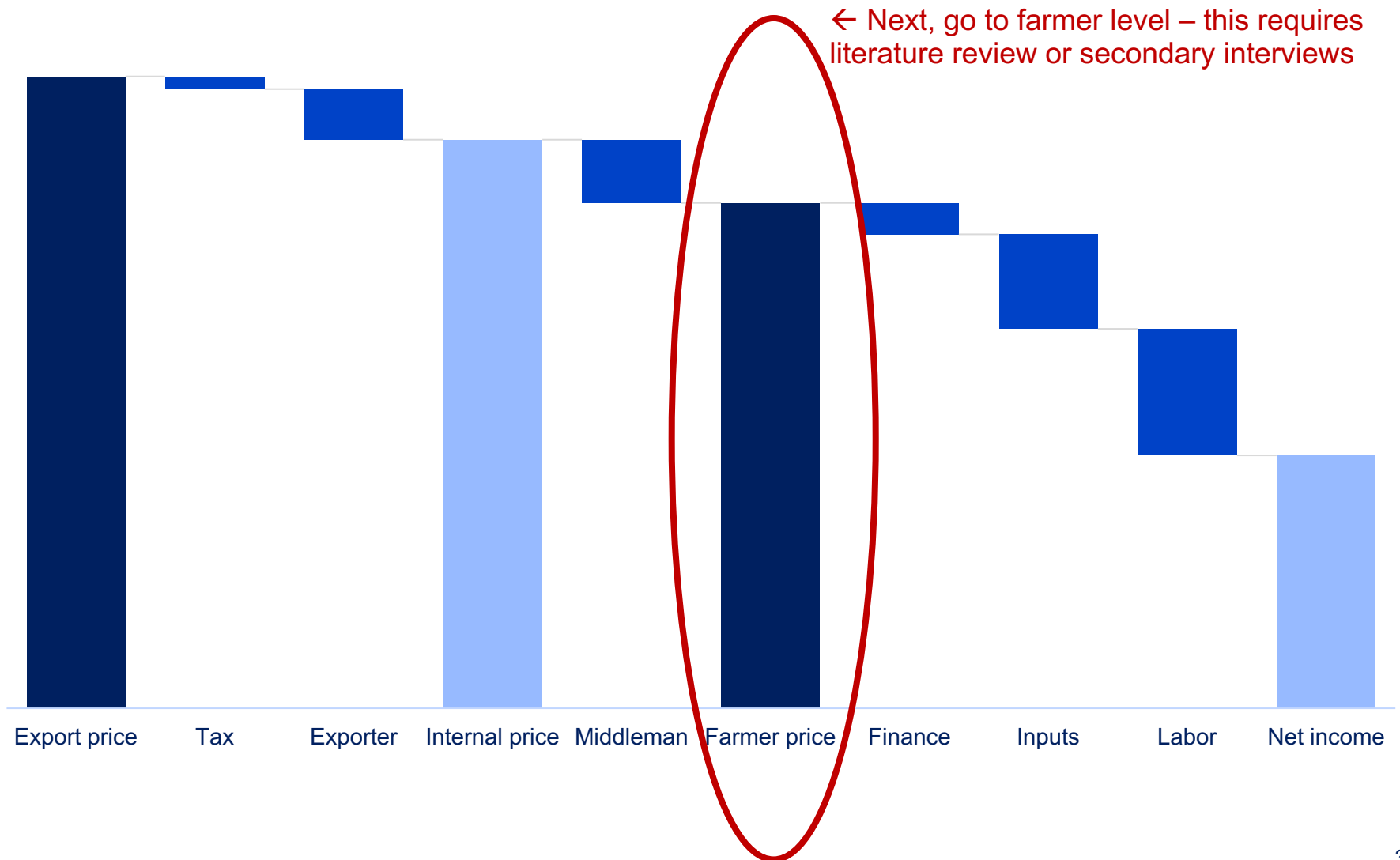
Big “commodity” producers tend to receive lower coffee prices

Coffee export price curve (2019)

US cents per pound green coffee



Breakdown costs and revenues for each actor, how value flows through the chain



Farm-gate prices usually require conversions to go from local units to standard international units

COLOMBIA EXAMPLE

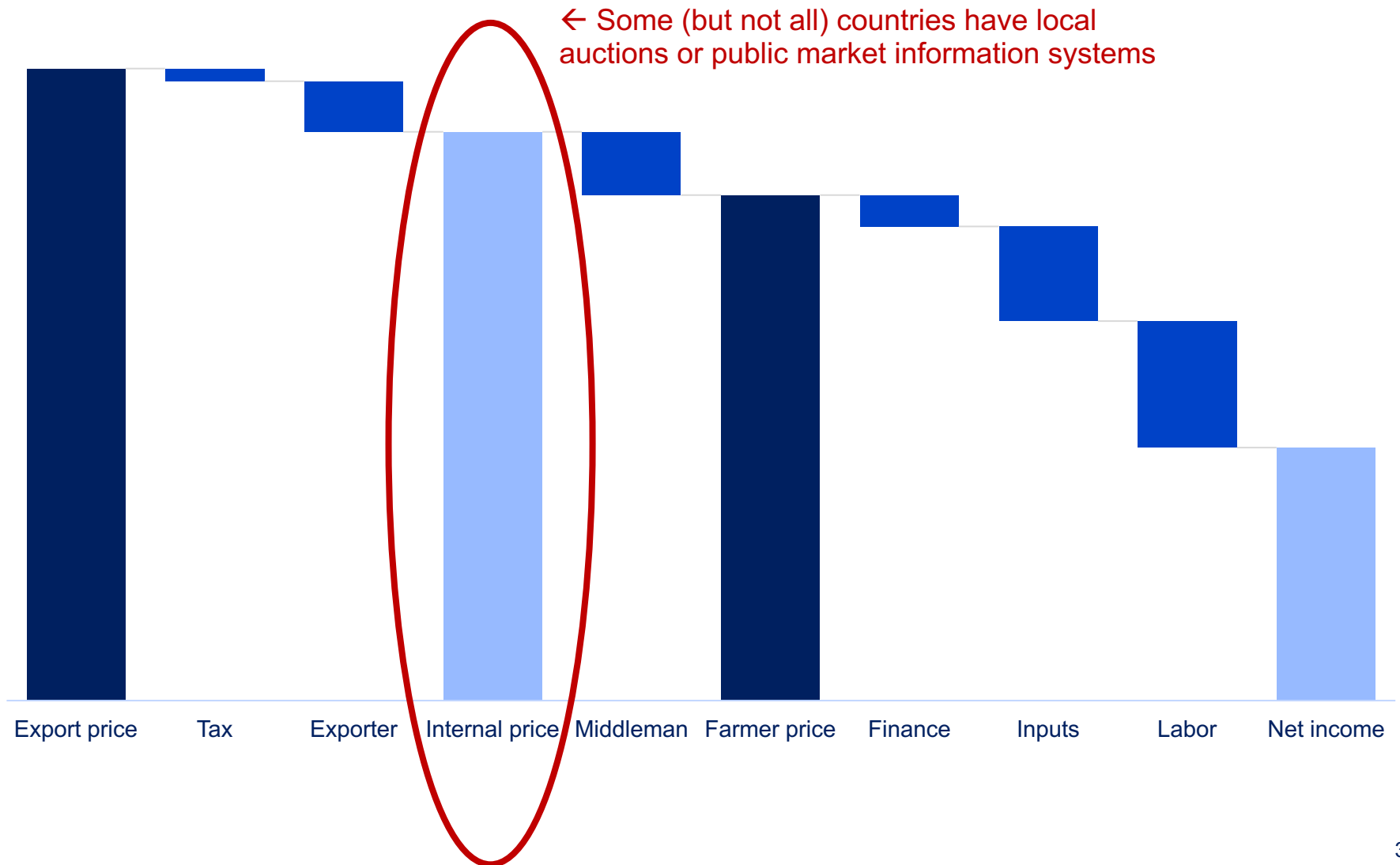


FAIRTRADE
INTERNATIONAL

	Conventional		Organic	
	COP	US\$ estimate	COP	US\$ estimate
Farm gate price (dried parchment) per kg	9,900	\$2.75	11,000	\$3.06
Farm gate price (dried parchment) per lb	4,500	\$1.25	5,000	\$1.39
Farm gate price (green bean equivalent) per lb	6,048	\$1.68	6,720	\$1.87
Conversion rate: 1 lb dried parchment = 0.744 lb green bean equivalent				

* COP to US\$ exchange rate: 3600

Breakdown costs and revenues for each actor, how value flows through the chain



Internal prices also require some local knowledge of quality grades and data analysis

KENYA EXAMPLE



NAIROBI COFFEE EXCHANGE TRANSACTION LISTING

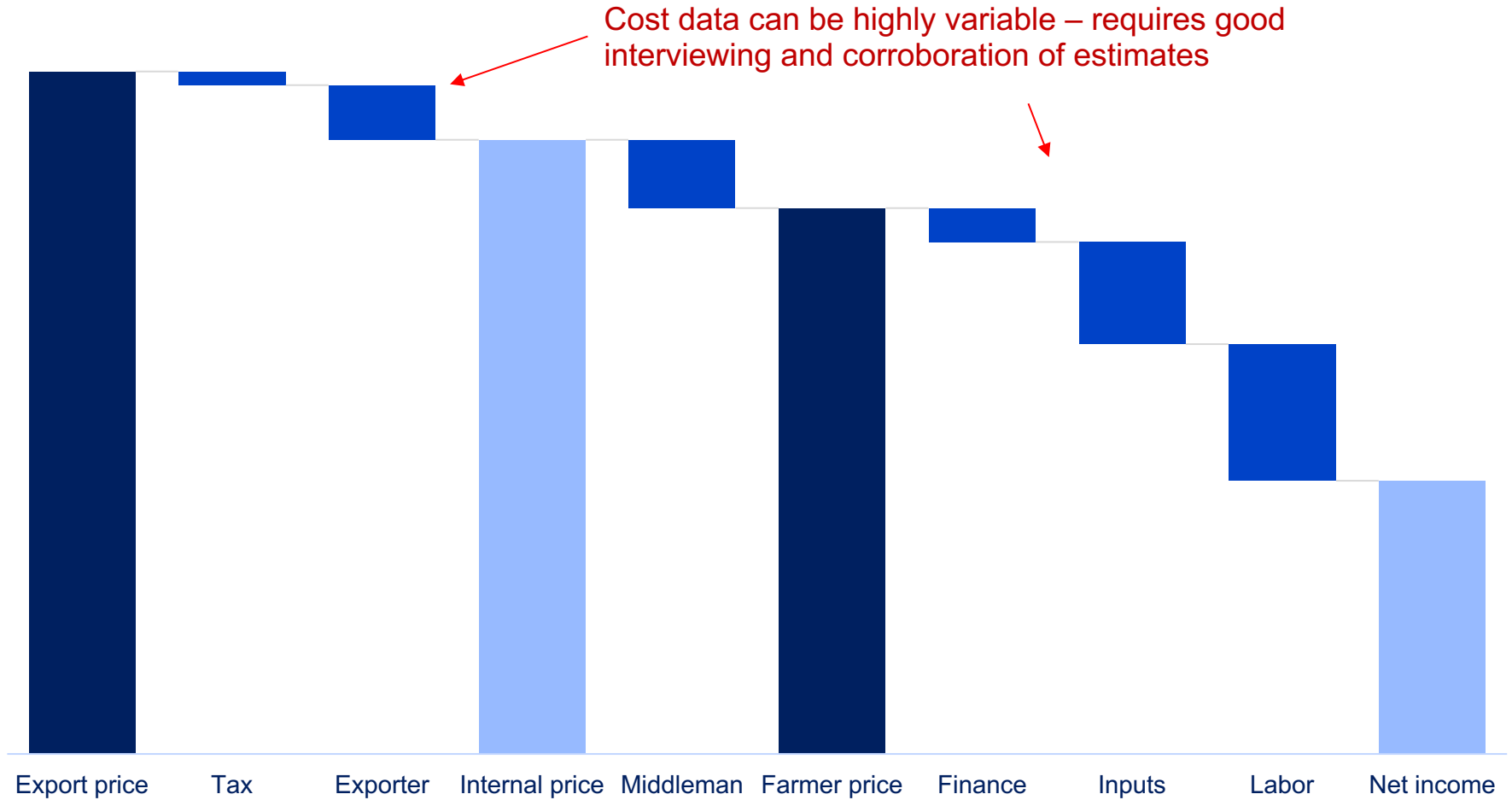


Sale 18 of Tuesday, February 22, 2022

2021 / 2022

Agent Aristocrats Coffee & Tea									
Lot N°	Marks/Outturn	Certificate	Grade	Full Bags	Weight (kilos)	Price / 50Kg	Gross Value	Buyer	Status
1501	19SS2006/T/BULK		T	14	857	234	4,010.76	Ibero Kenya Ltd	noted
1502	19SS2002/T/BULK		T	18	1,091	252	5,498.64	Louis Dreyfus Company	confirmed
1503	19SS2001/T/BULK		T	20	1,247	248	6,185.12	Ibero Kenya Ltd	noted
1504	18SS2015/T/SASINI	CAFE, RFA, UTZ	T	19	1,189	248	5,897.44	Ibero Kenya Ltd	noted
1505	17SS2005/T/BULK		T	15	909	251	4,563.18	Louis Dreyfus Company	confirmed
1506	17SS2002/T/BULK		T	23	1,445	249	7,196.10	Ibero Kenya Ltd	noted
1507	20SS2020/T/SASINI	CAFE, RFA, UTZ	T	15	954	253	4,827.24	Louis Dreyfus Company	noted
1508	18SS2012/TT/SASINI	CAFE, RFA, UTZ	TT	13	843	285	4,805.10	C.Dorman Ltd	noted
1509	18SS2010/TT/BULK		TT	23	1,399	276	7,722.48	Ibero Kenya Ltd	noted

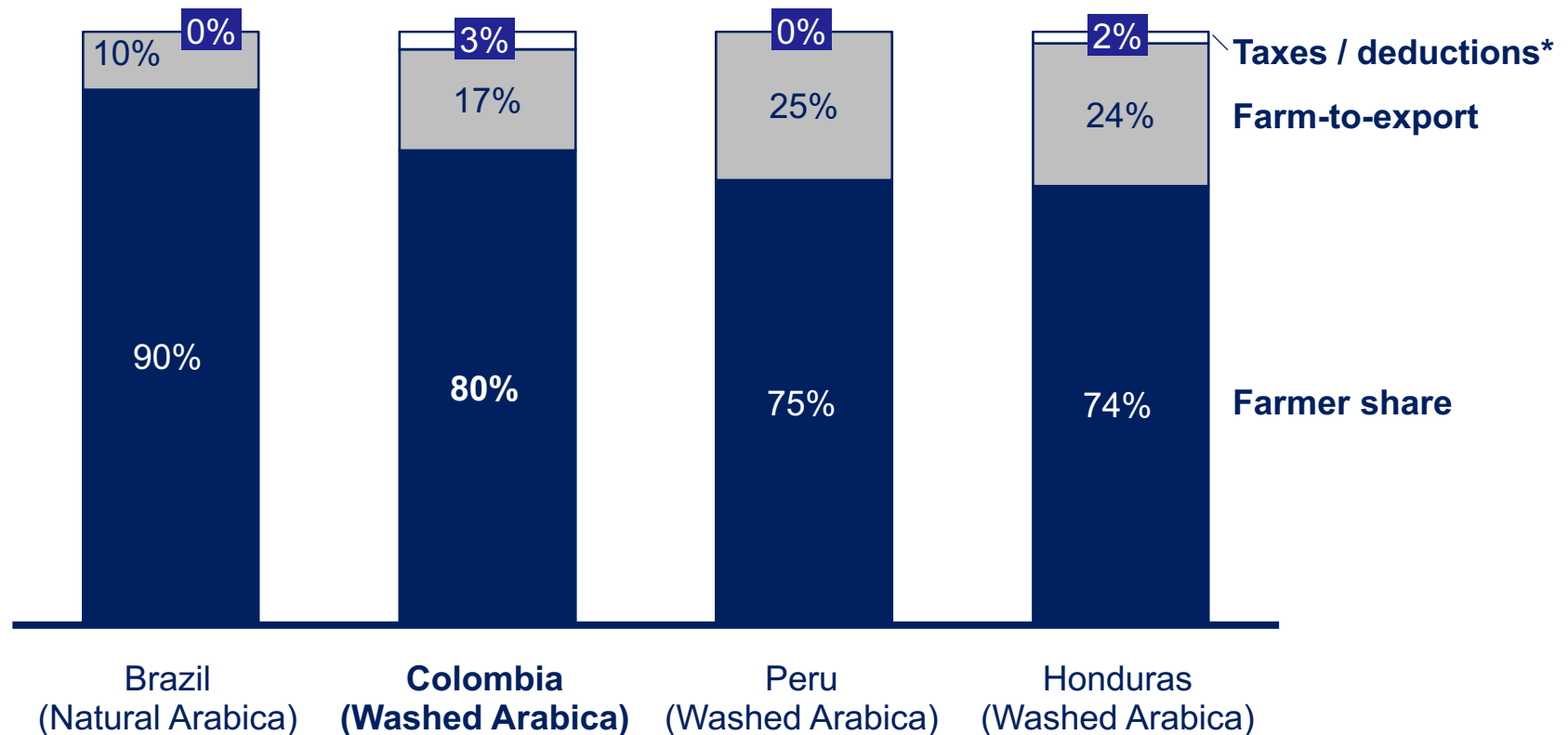
Breakdown costs and revenues for each actor, how value flows through the chain



Benchmark performance of the value chain

Efficiency levels of major Latin American coffee supply chains, 2012/13

100% = average export price



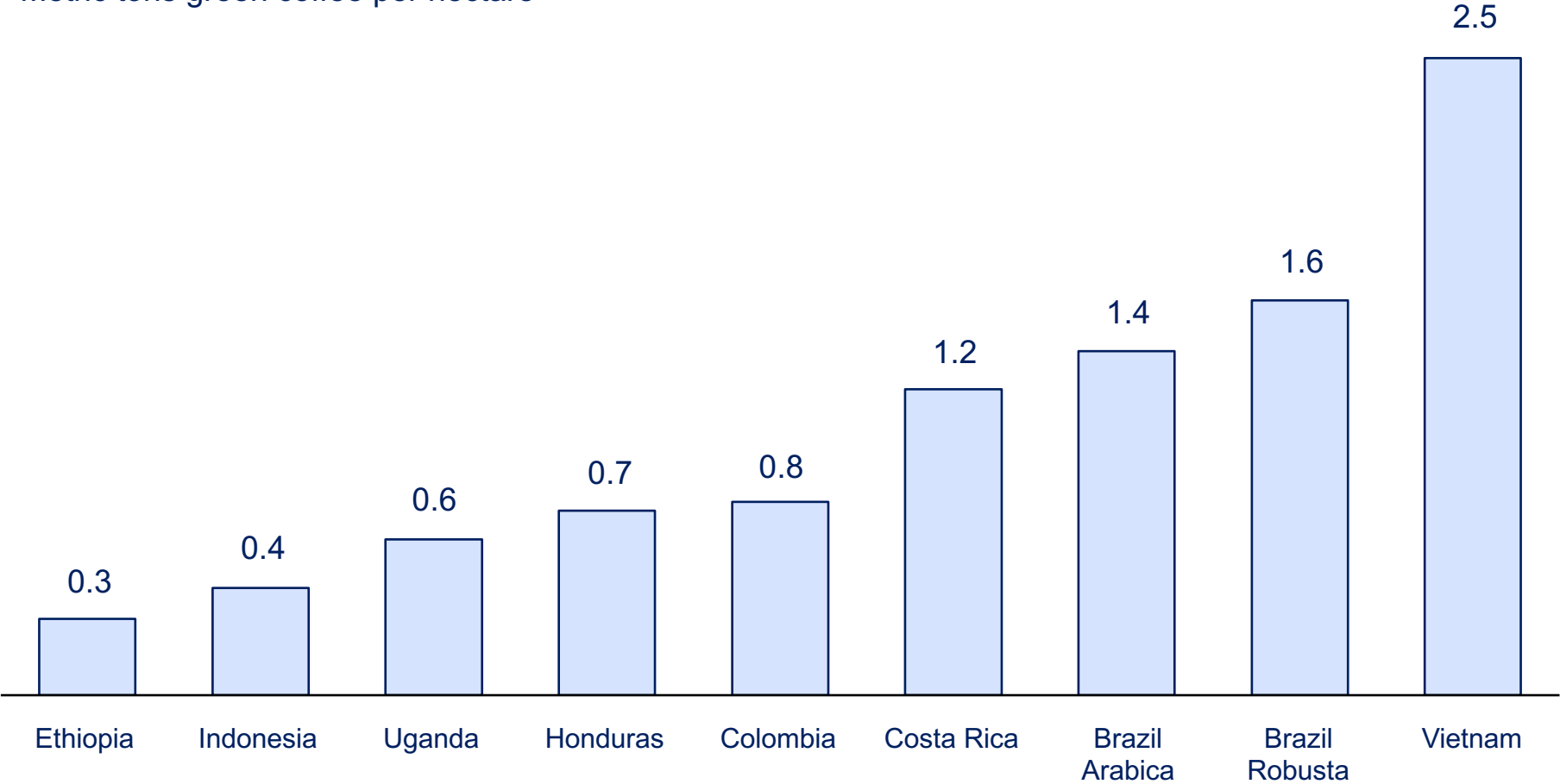
* Coffee contribution of US\$ 6 cents/lb in Colombia and US\$ 4.25 per 46-kg bag in Honduras (not considering 'retención' of US\$ 9 per 46 kg bag that is reimbursed to registered farmers after payment)

** Calculated as difference between farm gate price and ICO price

Source: trade statistics; TechnoServe analysis and interviews in Brazil, Colombia, Honduras and Peru

Benchmark performance of the value chain

Average coffee farm yields*
Metric tons green coffee per hectare



*National average based on total production (average of last two crops) and area under coffee; includes both Arabica and Robusta unless noted otherwise

Source: USDA; TechnoServe analysis

Global coffee value chain review

1

MAP

- Diverse supply base: 20+ countries, >10 million farms, varying levels of sophistication
- Most coffee sold for export

2

BREAKDOWN

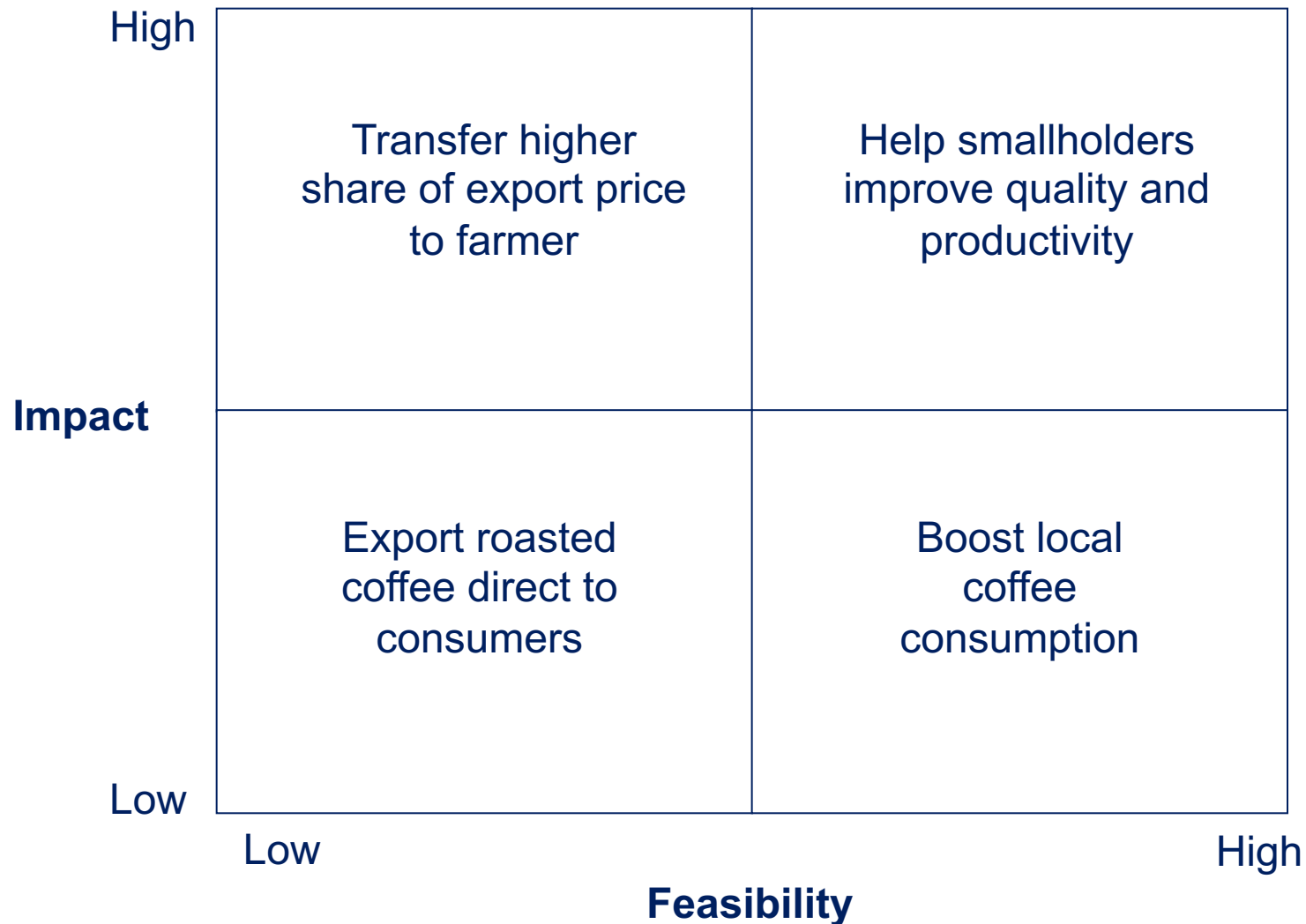
- Prices set internationally
- Production costs are influenced by local policies and conditions (e.g., taxes, wages, infrastructure, etc.)

3

BENCHMARK

- Lower price countries (Brazil and Vietnam) have higher yields
- Higher price countries (Colombia and Ethiopia) have lower yields

Recommendations for global coffee value chain

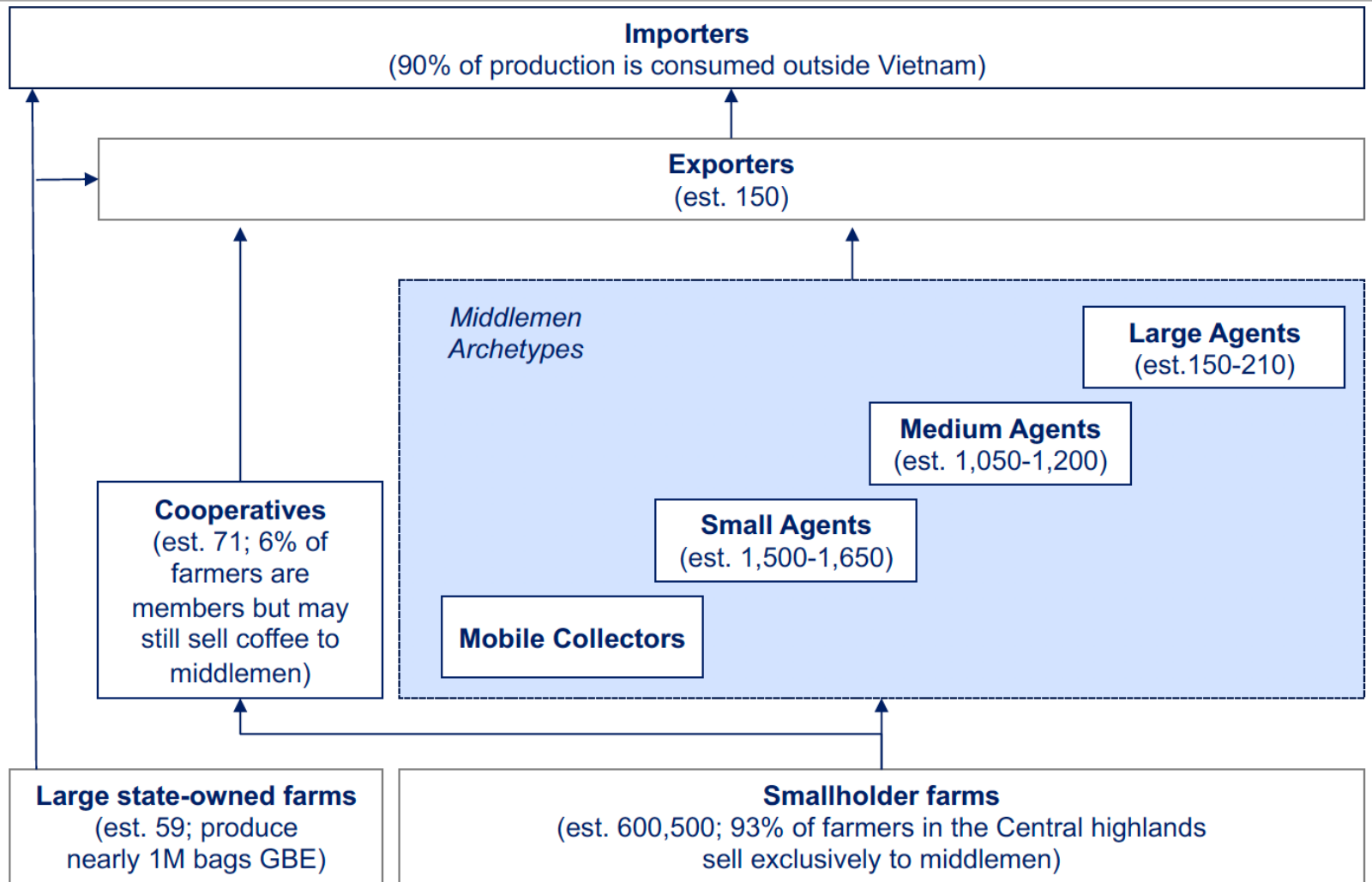


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- The Value Chain Framework
- **Case Study: Vietnam**
- Case Study: Colombia

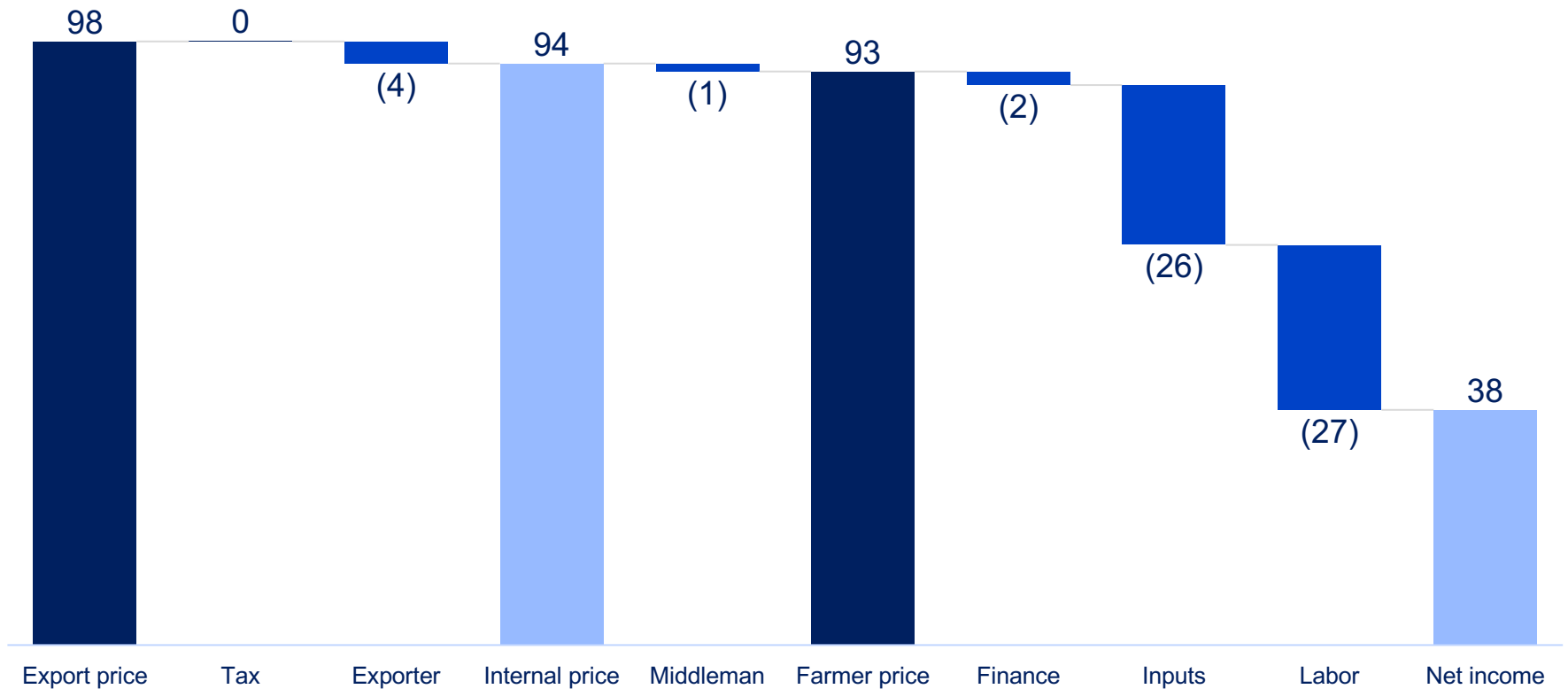
Vietnam has ~600,000 coffee farmers and a highly competitive “middleman” economy

Coffee Value Chain in Vietnam (Export)



Vietnamese farmers earn 95% of the export price

Illustrative Vietnam Robusta supply chain cost breakdown
US cents per pound green

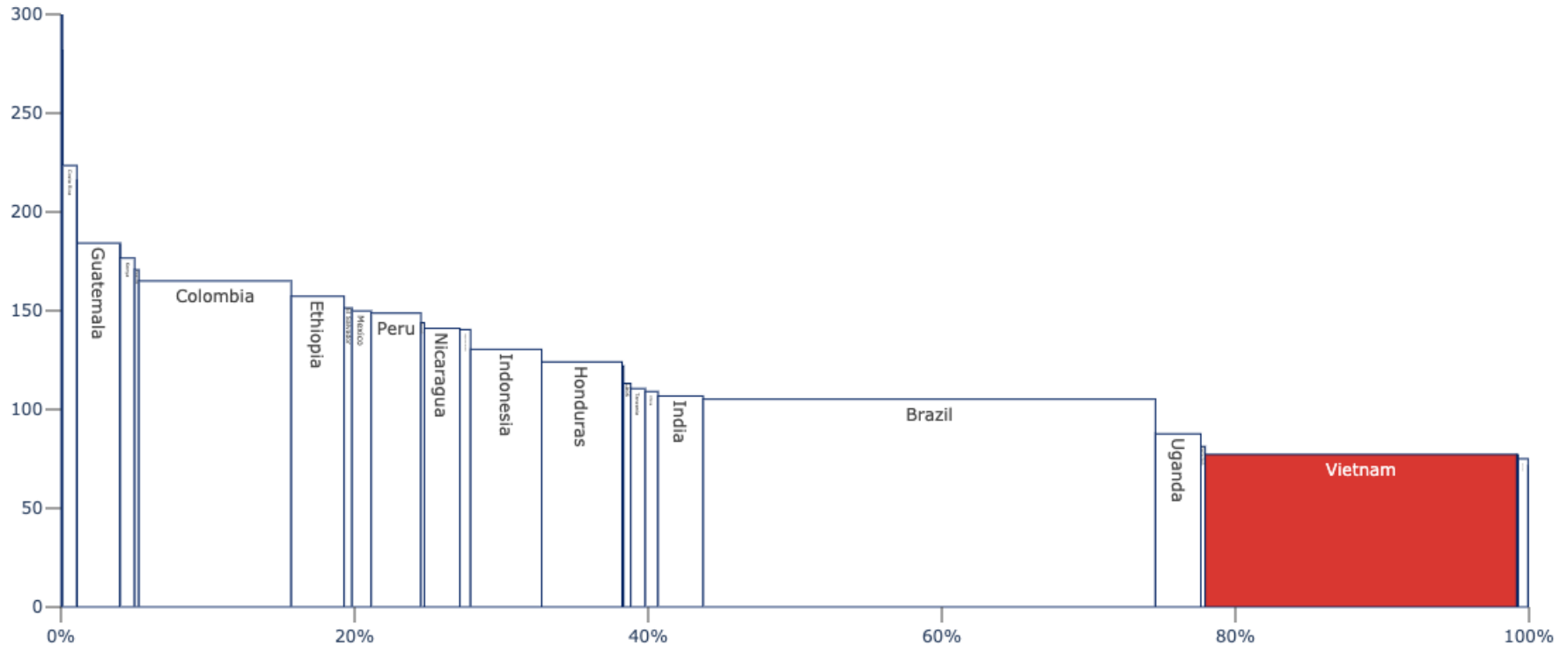


DATE: March 8, 2013 (for pricing)

Source: interviews with local and multinational exporters

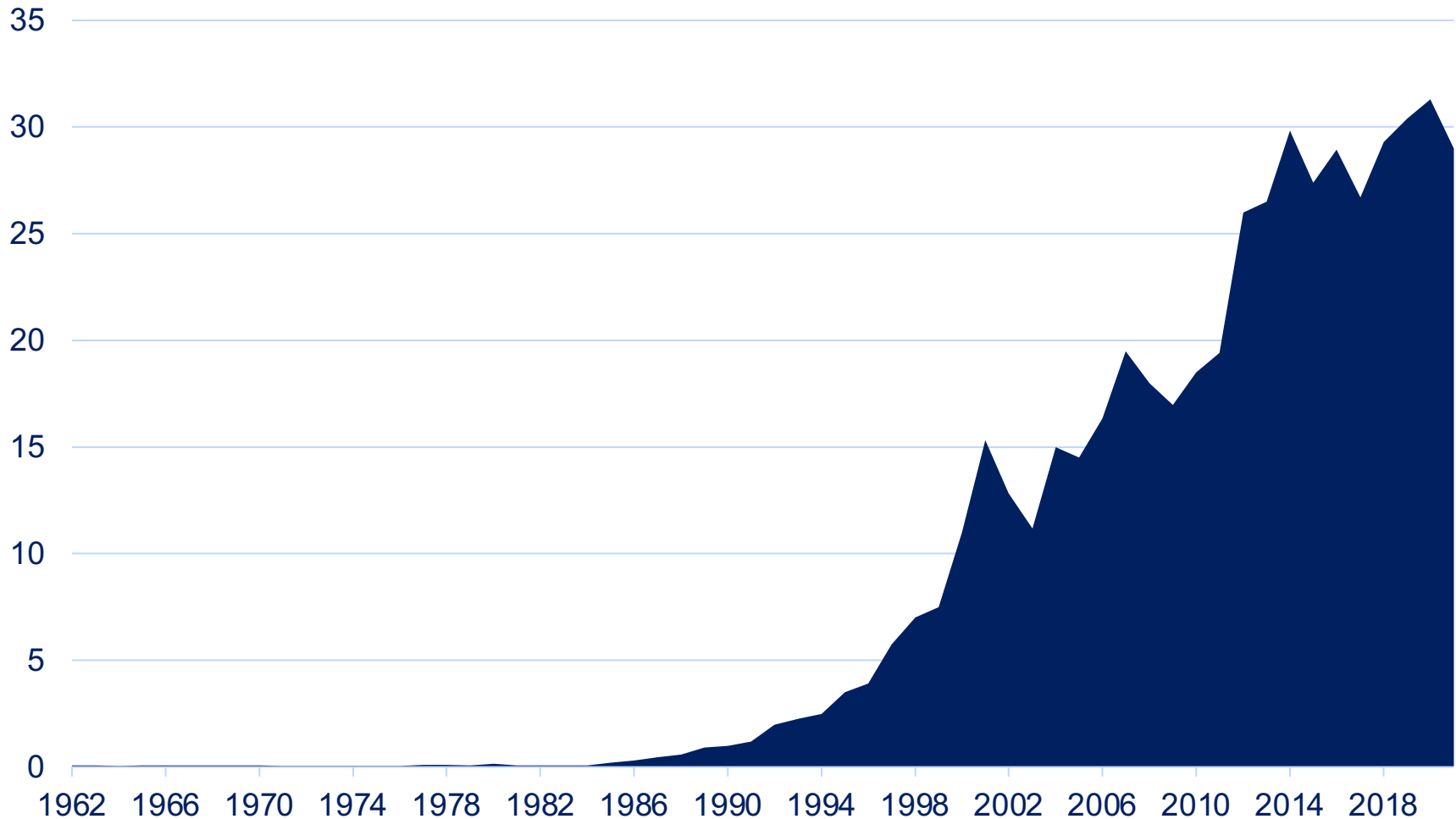
Vietnam supplies ~20% of market at a low price

Coffee export price curve (2019)
US cents per pound green coffee



Vietnam increased its coffee production rapidly

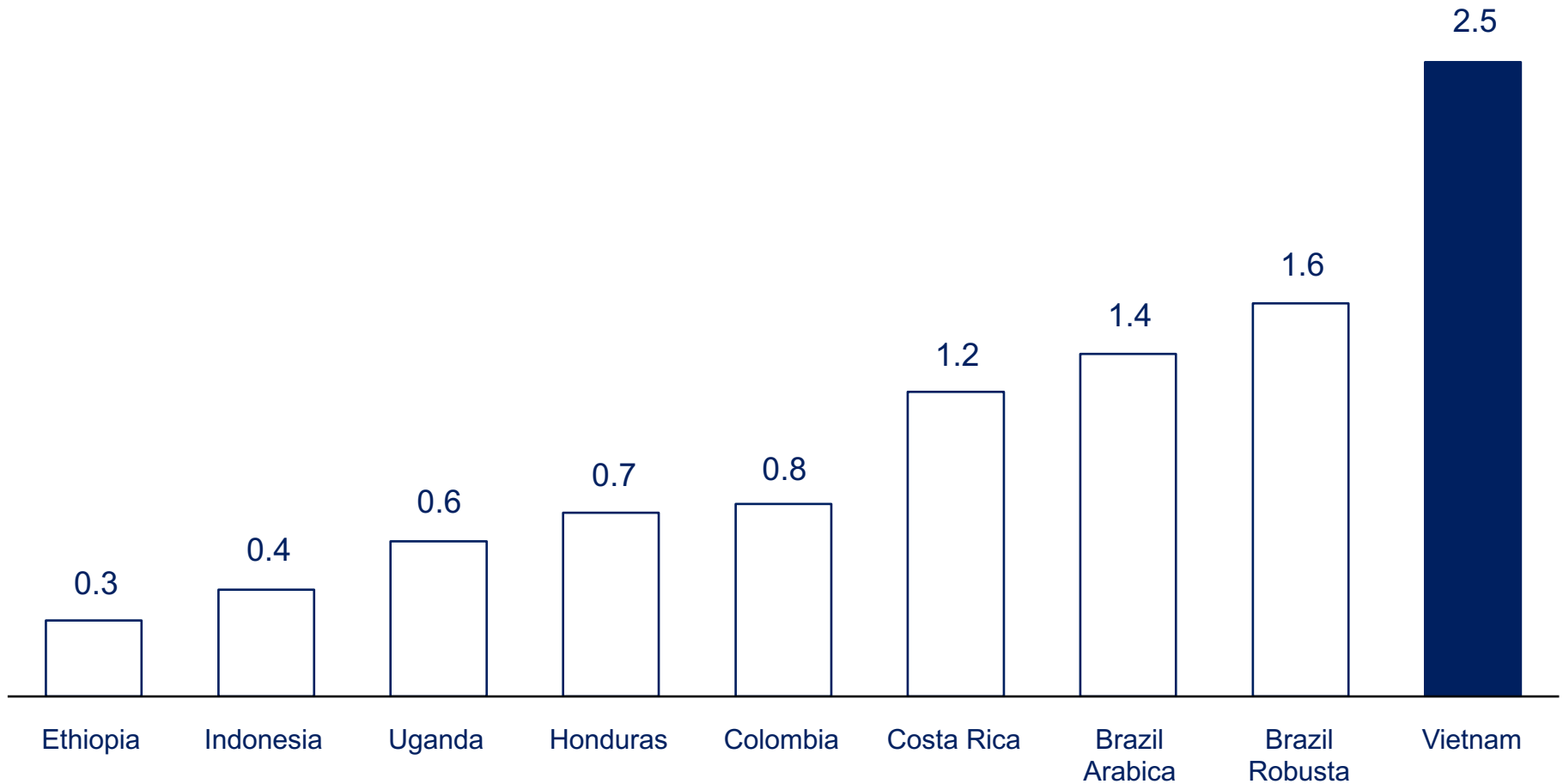
Vietnam coffee production
Bags (60-kg), millions



Vietnamese farms have very high yields

Average coffee farm yields*

Metric tons green coffee per hectare



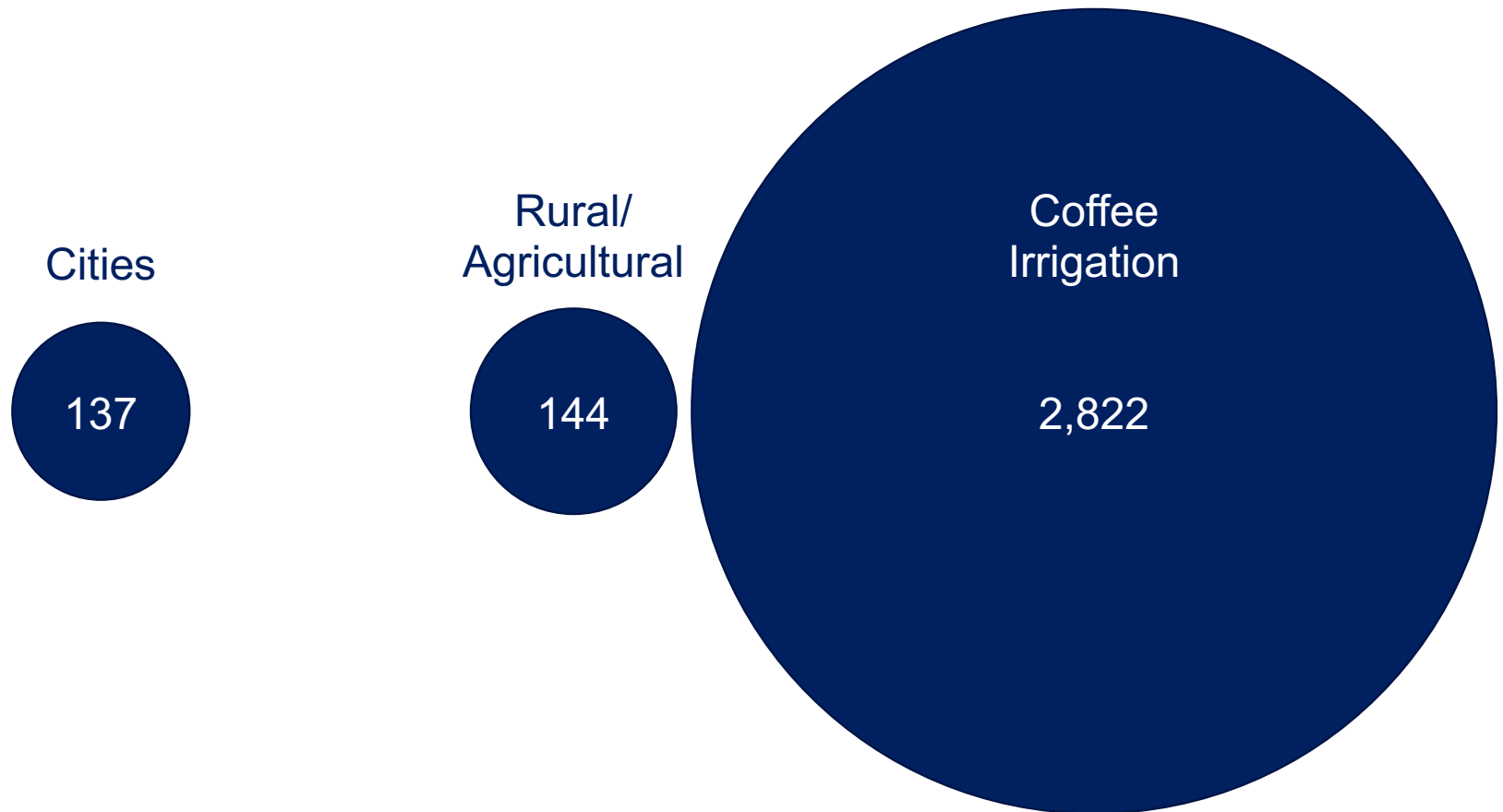
*National average based on total production (average of last two crops) and area under coffee; includes both Arabica and Robusta unless noted otherwise

Source: USDA; TechnoServe analysis

Coffee production has a large environmental footprint

Total water demand in Vietnam's Central Highlands

Tons per household* per year



* Assumes average household size of 4.5

Source: D'Haeze 2004; Lu 2002; extrapolations to current estimated rates of urban and rural usage



Vietnam review

1

MAP

- Approx. 600,000 mostly small-scale farmers
- Growth-focused government policies (land rights, credit access, lots of competition, etc.)

2

BREAKDOWN

- Farmers earn 95% of export price
- Margins for exporters / collectors are very slim (<1%)

3

BENCHMARK

- High farm yields and low costs relative to other coffee countries
- Production has a large environmental footprint

Recommendations for Vietnam's coffee value chain

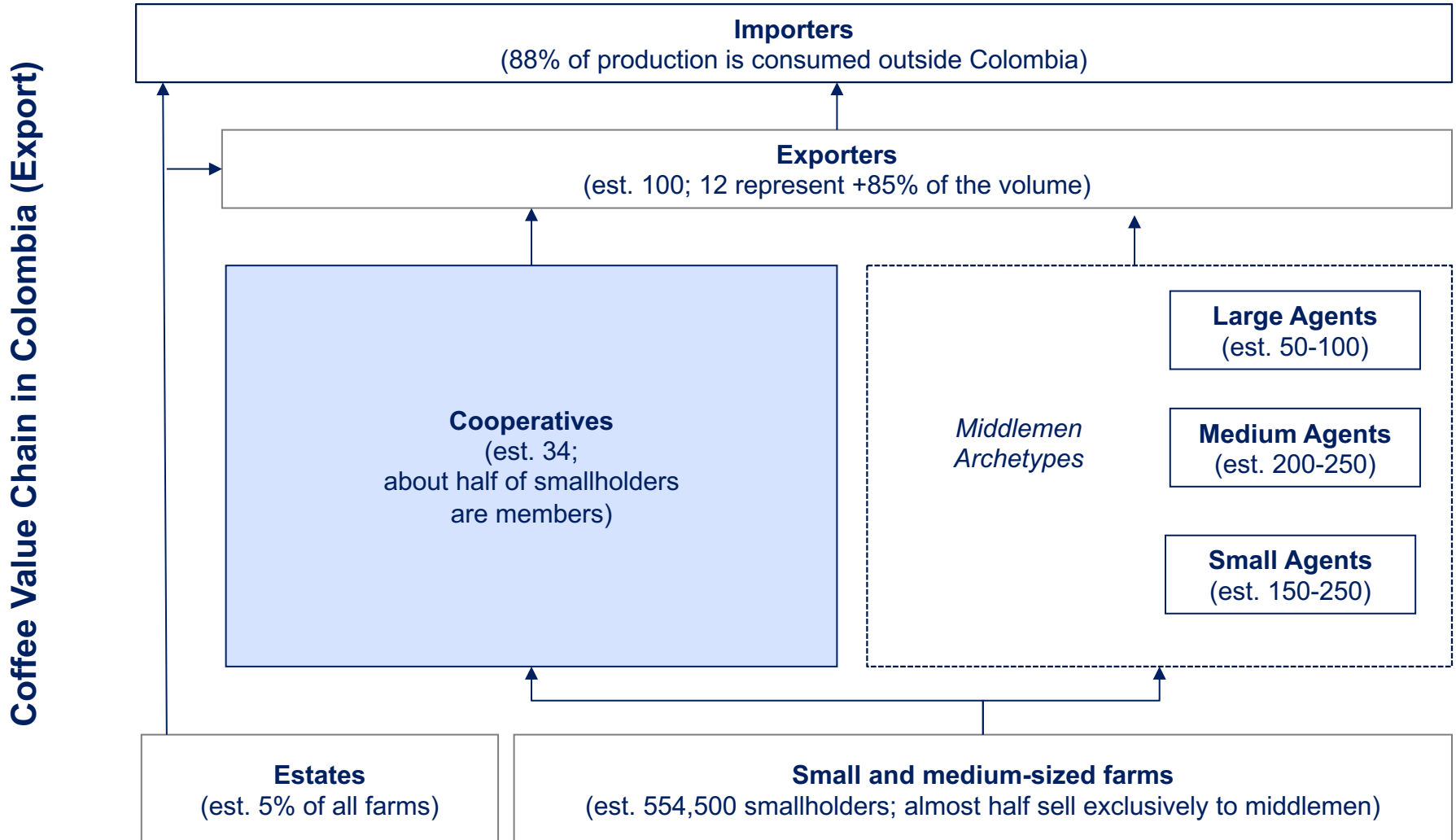
Impact	High	Improve environmental stewardship (reduce water footprint)	Sell roasted coffee products into regional markets (increase value of exports)
	Low	Organize farmer cooperatives and cut out middlemen (increase farmer share of price)	Boost local coffee consumption (increase avg price to farmer)
		Low	High

Feasibility

Plan for today

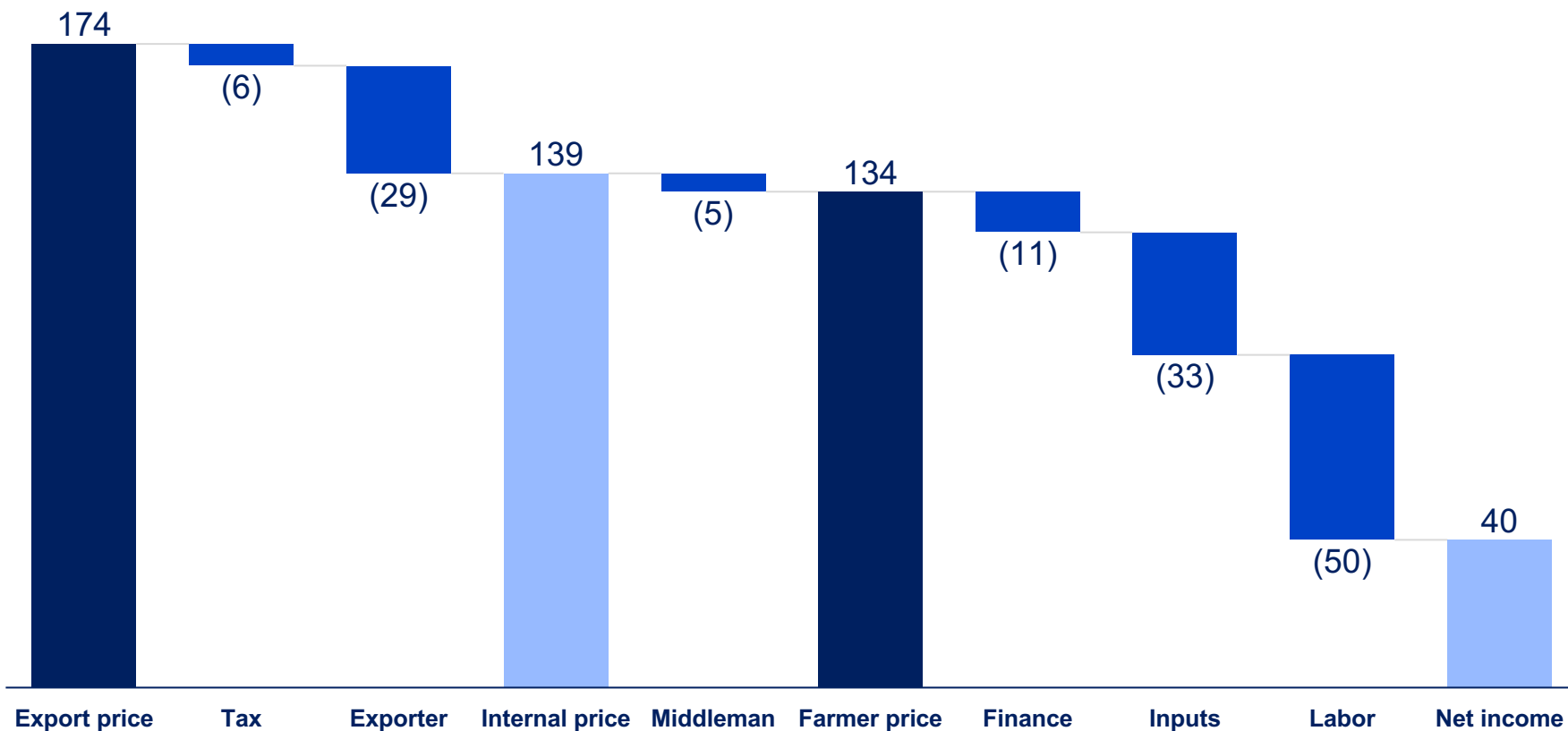
- The Coffee Value Chain
- The Value Chain Framework
- Case Study: Vietnam
- **Case Study: Colombia**

Colombia has ~550,000 coffee farmers and a strong cooperative sector



Colombian farmers earn 80% of the export price

Illustrative Colombia Arabica supply chain cost breakdown
US cents per pound green



Note: Cost of production does not include costs for installation of wet milling equipment, tree renovation or financing

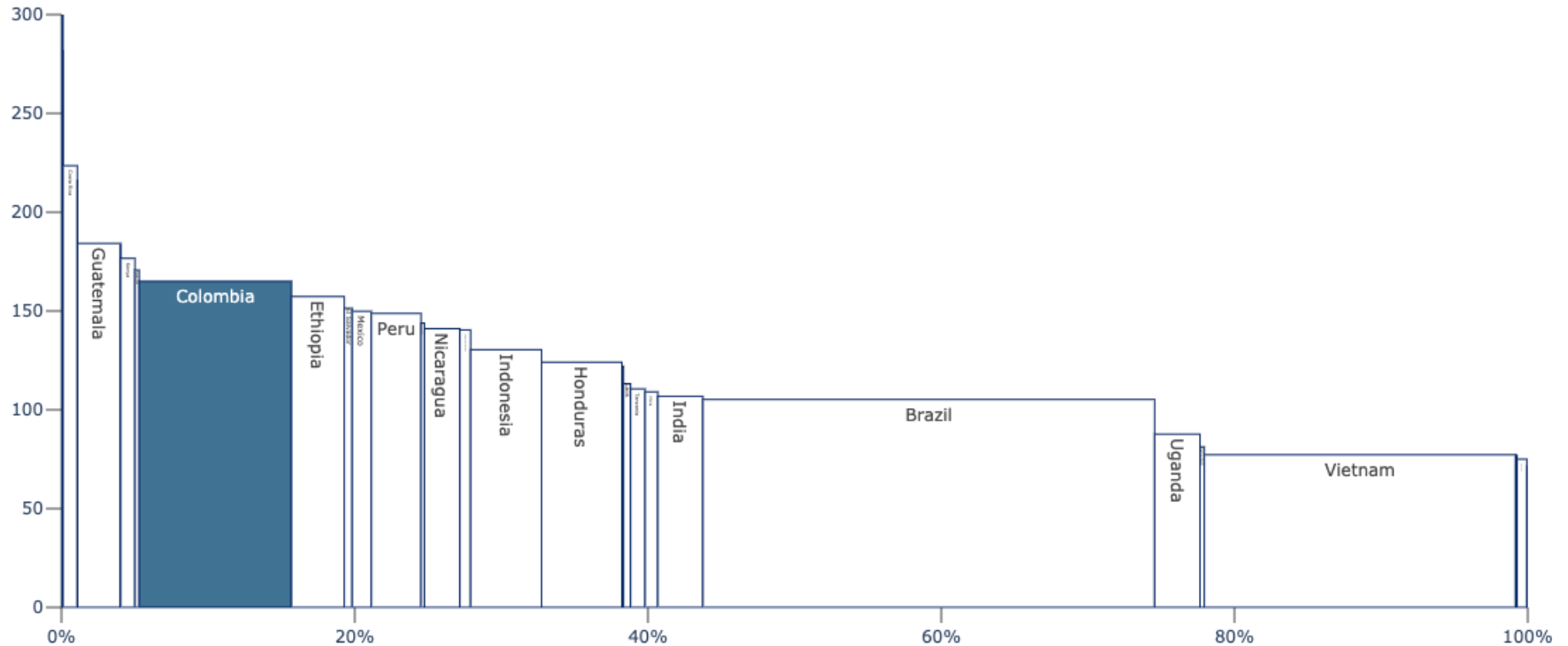
* Normalized to 2012/13 average commodity prices – Arabica ICE “C” of \$1.50 but adjusted for market differentials

** Includes farm tools, equipment, internal transport, etc.

Source: Stakeholder interviews, TechnoServe analysis

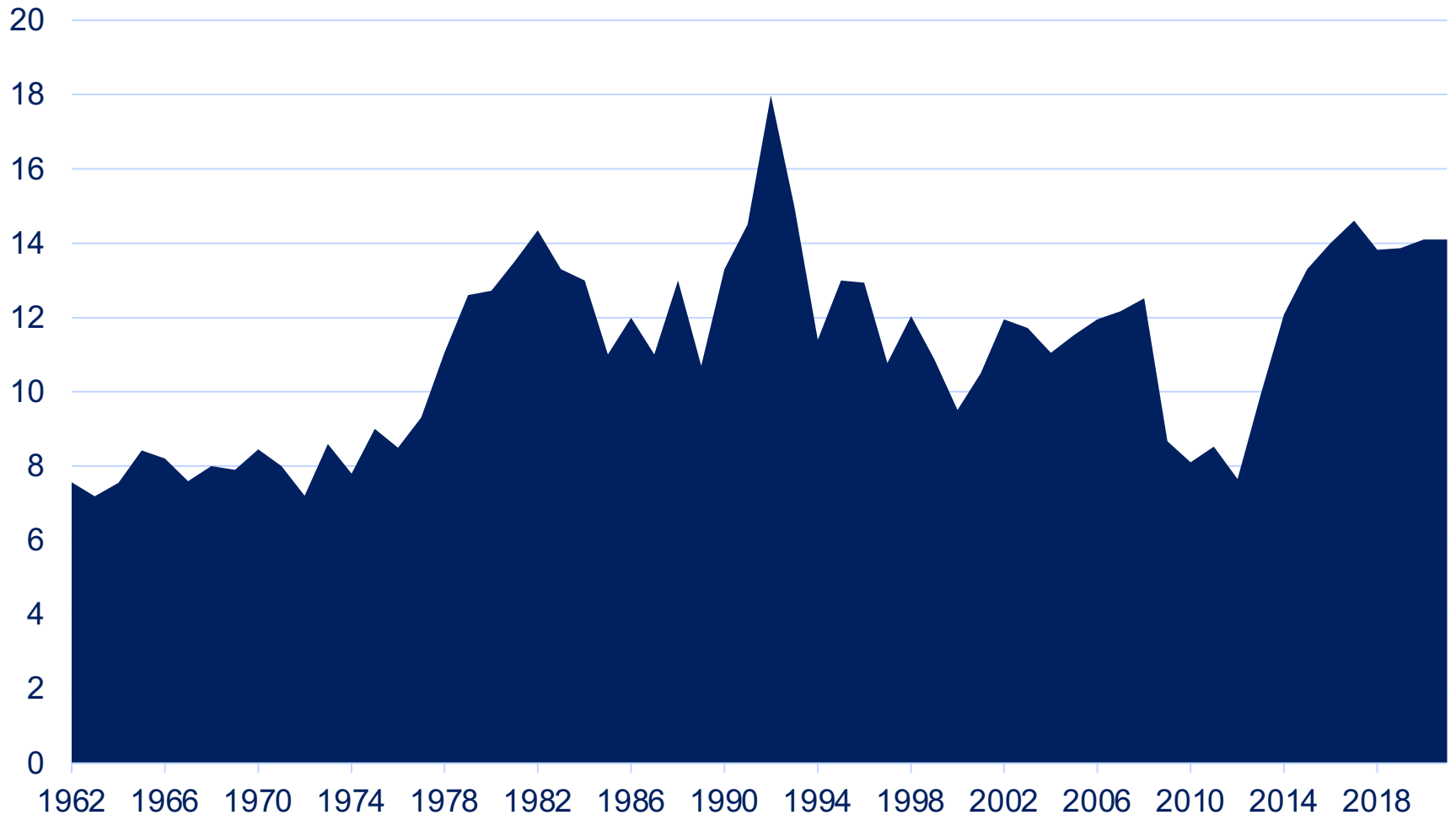
Colombia supplies ~10% of market at a premium price

Coffee export price curve (2019)
US cents per pound green coffee



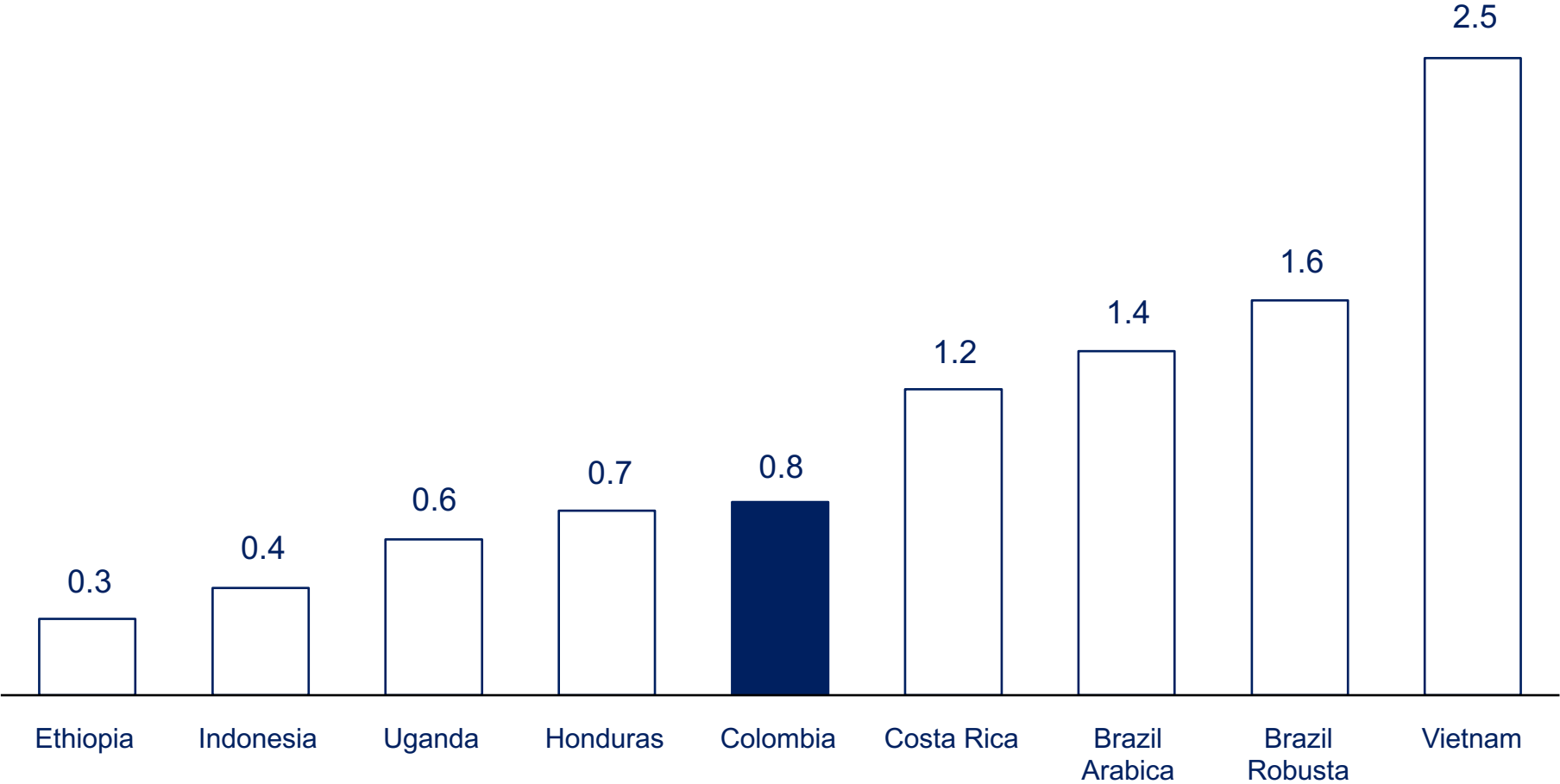
Colombia's coffee production has been relatively stable

Colombia coffee production
Bags (60-kg), millions



Colombian farms have average level yields

Average coffee farm yields*
Metric tons green coffee per hectare

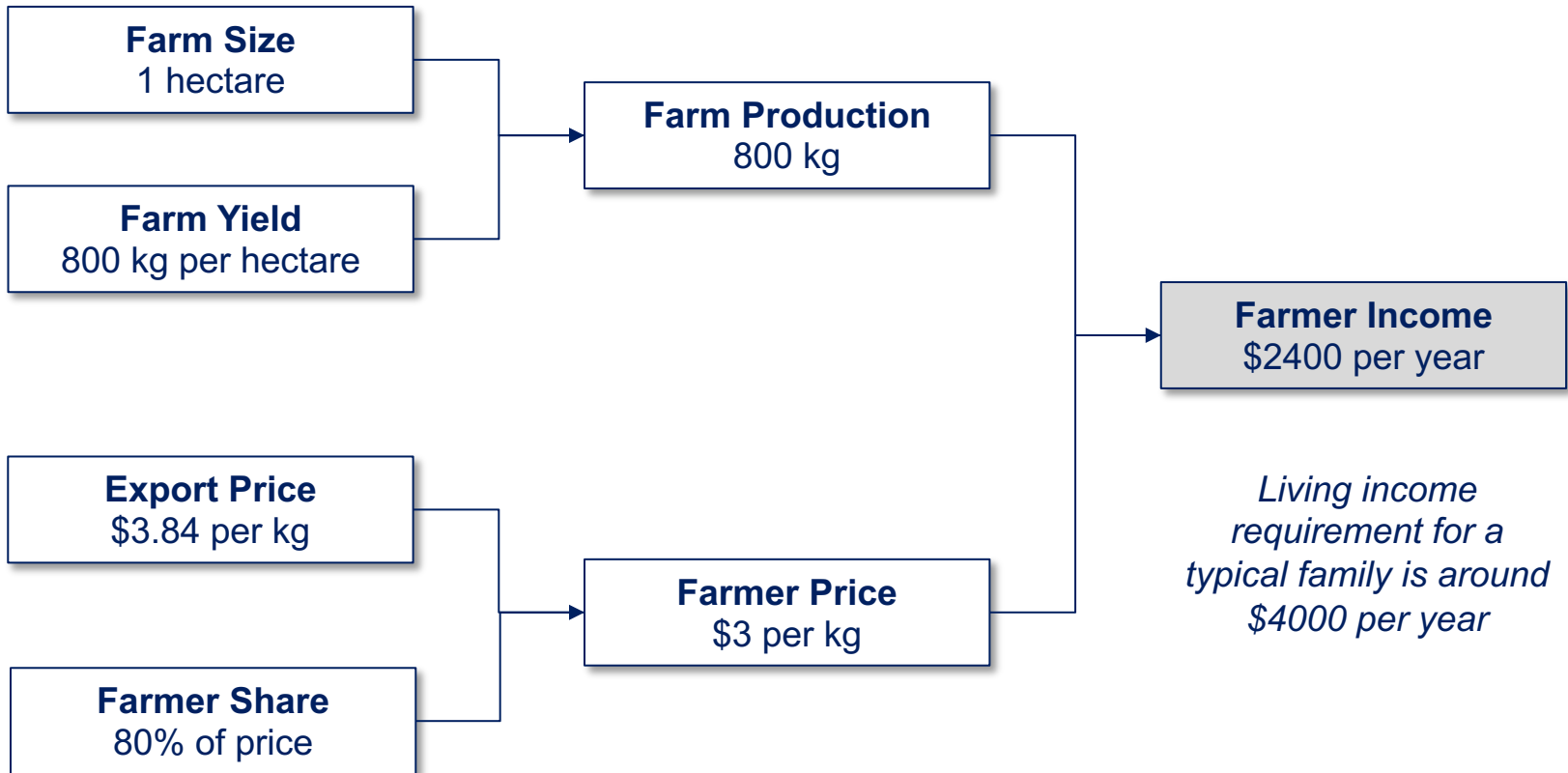


*National average based on total production (average of last two crops) and area under coffee; includes both Arabica and Robusta unless noted otherwise

Source: USDA; TechnoServe analysis

Many Colombian farms struggle to earn a living income from coffee

SIMPLIFIED MODEL



Colombia review

1

MAP

- Approx. 500,000 mostly small-scale farmers
- Unique supply chain with mix of private, public and cooperative operators

2

BREAKDOWN

- Farmers earn 80% of export price
- Strong cooperative sector and institutional support provided by government (through tax)

3

BENCHMARK

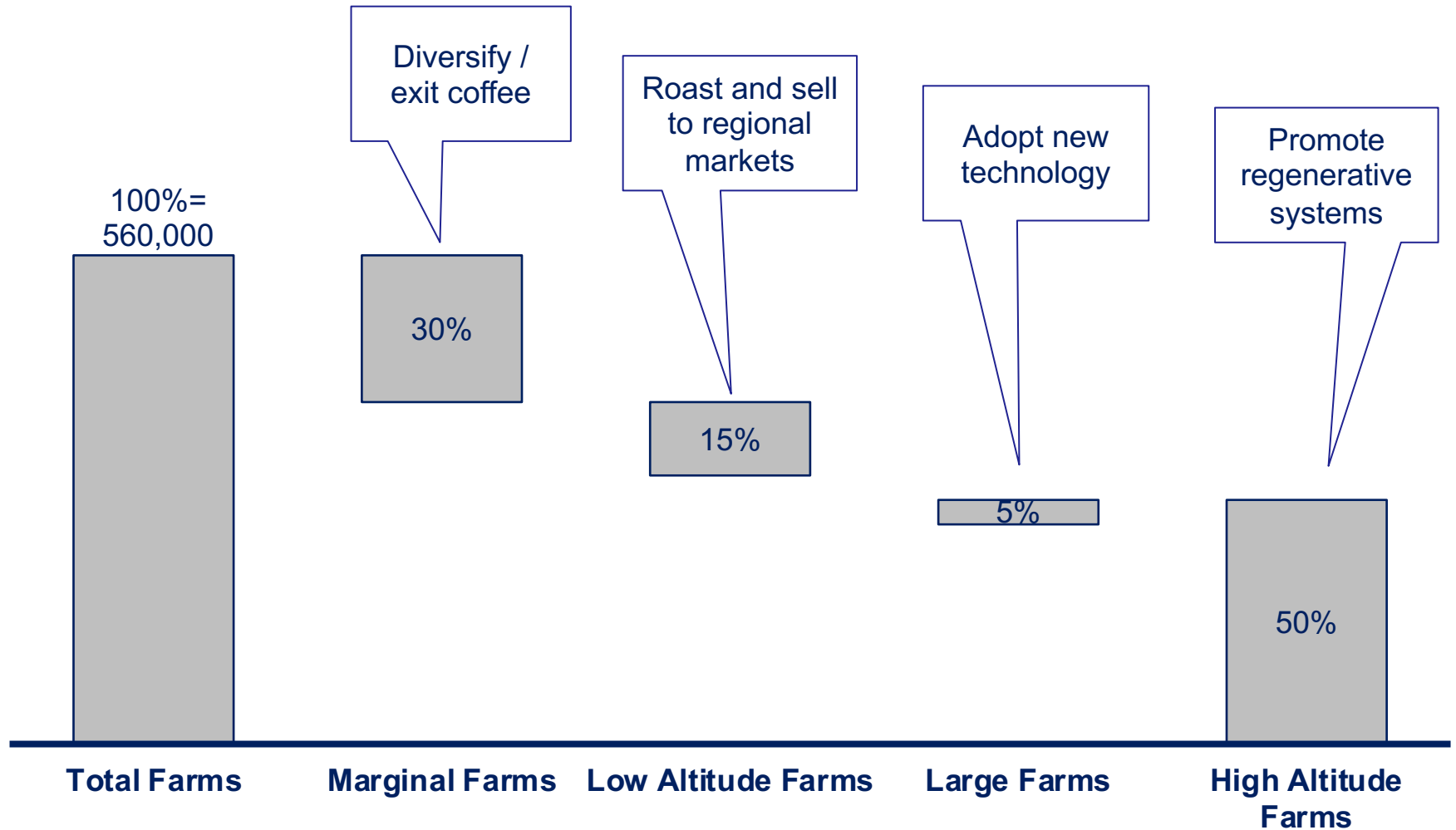
- Average yields and average costs relative to other coffee countries
- Many farmers are unable to achieve a living income solely from coffee

Recommendations for Colombia's coffee value chain

Impact	High	Assist farmers to diversify their income or subsidize to exit coffee (increase incomes)	Invest in “regenerative ag” (reduce farming cost and increase export price)
	Low	Sell roasted coffee products into regional markets (increase value of exports)	Introduce new technology (reduce farming cost and increase yields)
		Low	High

Feasibility

Recommendations can also be segmented by producer type



Plan for today

- The Coffee Value Chain
- The Value Chain Framework
- Case Study: Vietnam
- Case Study: Colombia

Plan for tomorrow

- Practical Advice
- Panel Discussion
- Q&A



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Guest lecture by Carl Cervone

March 23, 2023

Plan for today

- **Panel Discussion**
- Case Study: Colombia
- Practical Advice

Panel discussion with Enveritas practitioners



Maria Burkiewicz

- Data Science
- Based in Poland



Senthil Nathan

- SE Asia, Operations
- Based in Indonesia



Nick Kirby

- Partnerships
- Based in NY

Sustainability indicators in the coffee industry



Social

- No Child Labor
- No Forced Labor
- Minimum Wage Respected
- No Discrimination
- Clean Water
- Decent Housing
- Worker Rights & Benefits
- Freedom of Association
- Written Contracts
- Occupational Health & Safety



Environmental

- No Deforestation
- No Pollution
- Biodiversity Protection
- Soil Conservation
- Water Conservation
- Energy Conservation
- No GMOs
- No Banned Pesticides
- Safe Chemical Handling
- Pest & Disease Management

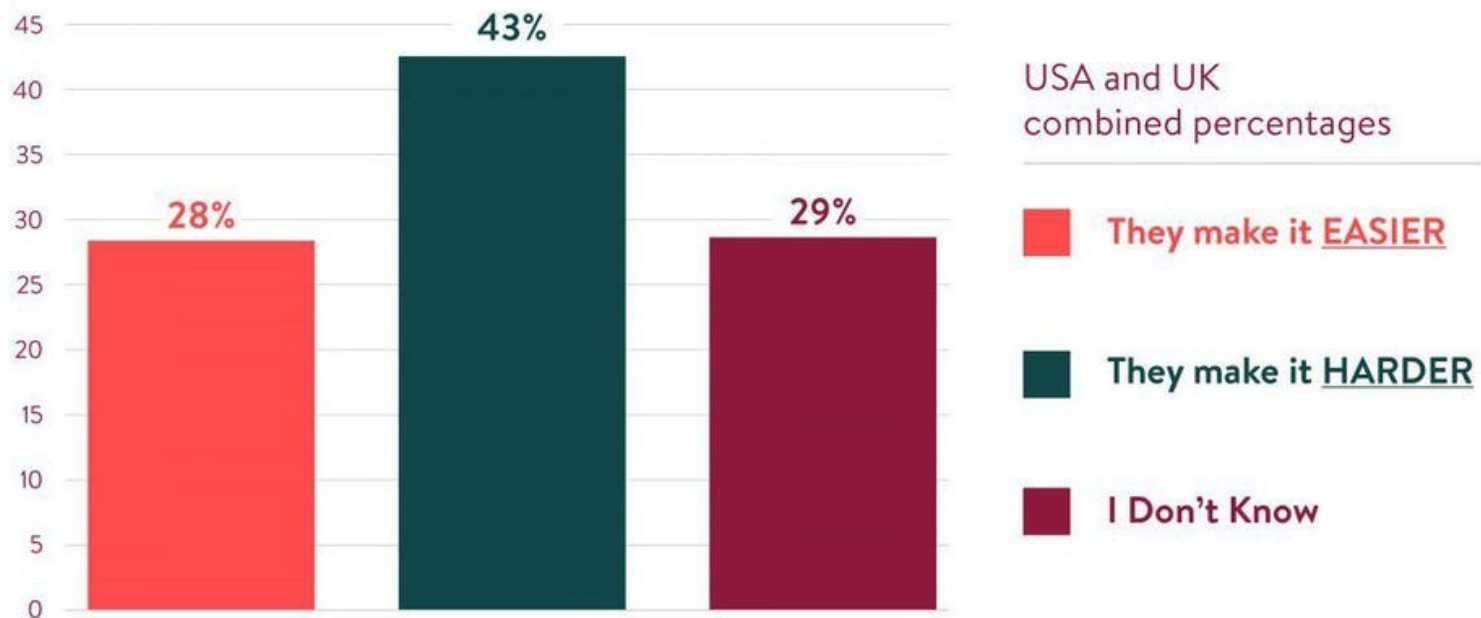


Economic

- Above Poverty Line
- Transparent Pricing
- Ethical Business Practices
- No Forced Land Evictions
- Sustainable Production
- Quality Improvement
- Traceability
- Access to Training
- Access to Finance
- Records Kept

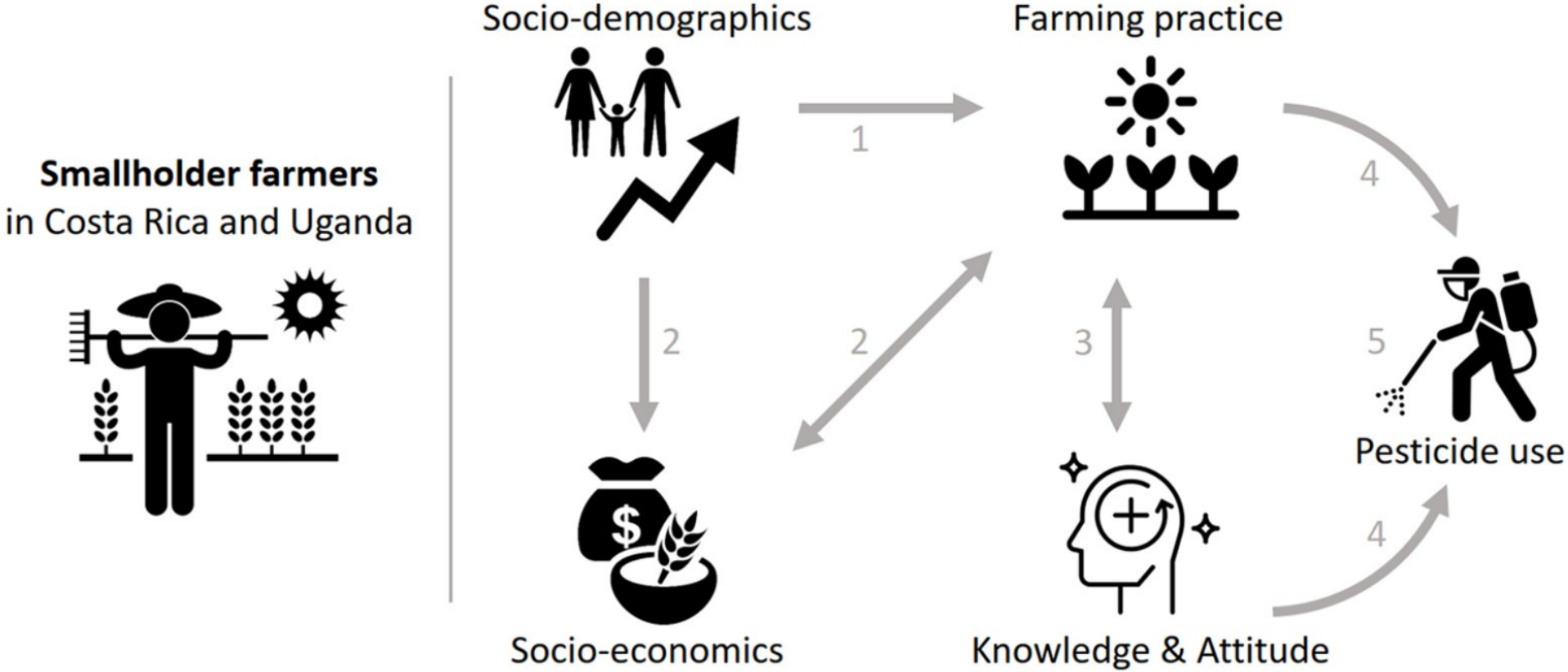
Consumer power

Do brands make it easier or harder for you to be environmentally friendly and ethical in your daily life?

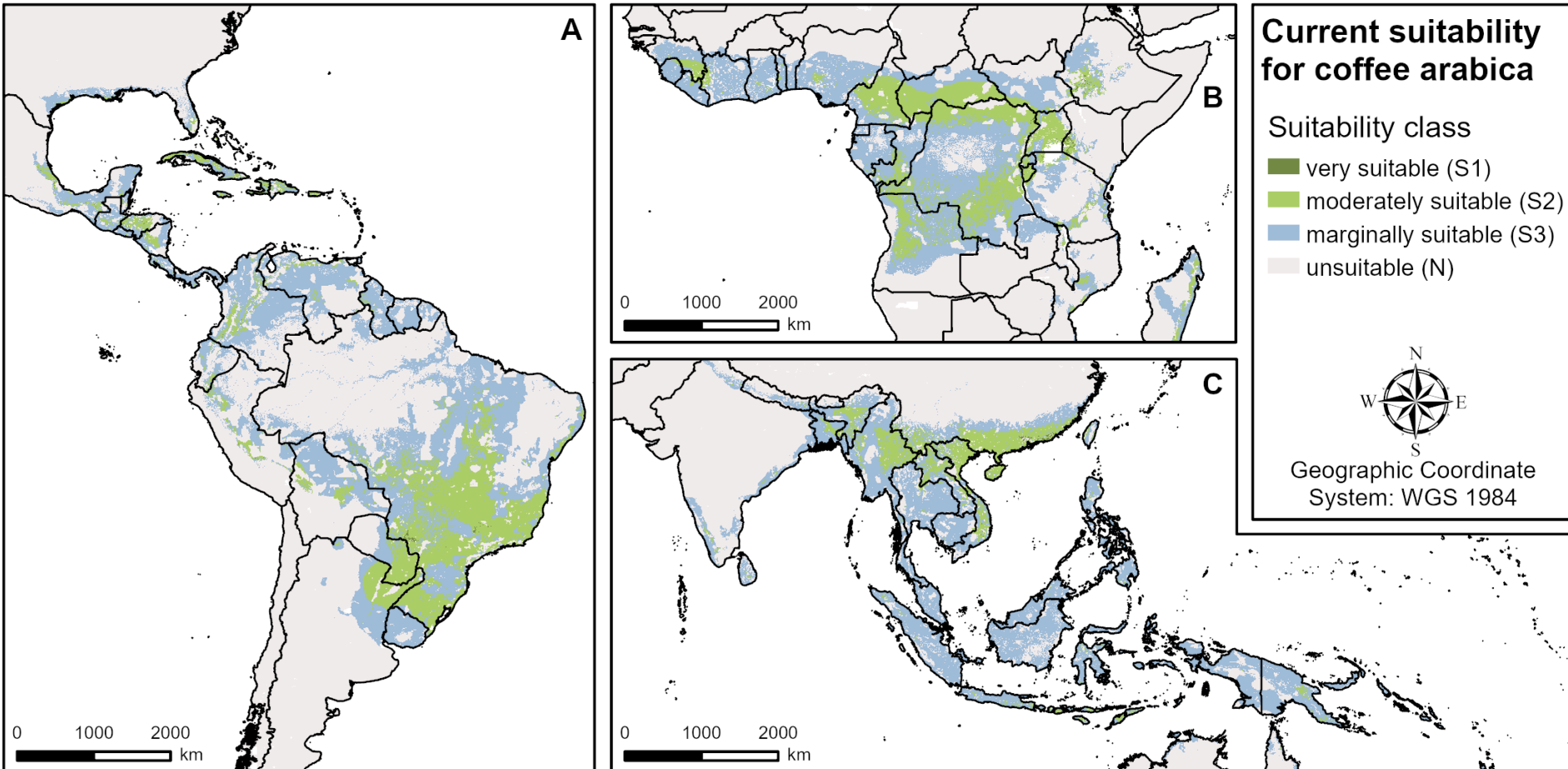


Survey of 1,004 respondents in the USA and UK.
November 2018 for Futerra by OnePulse

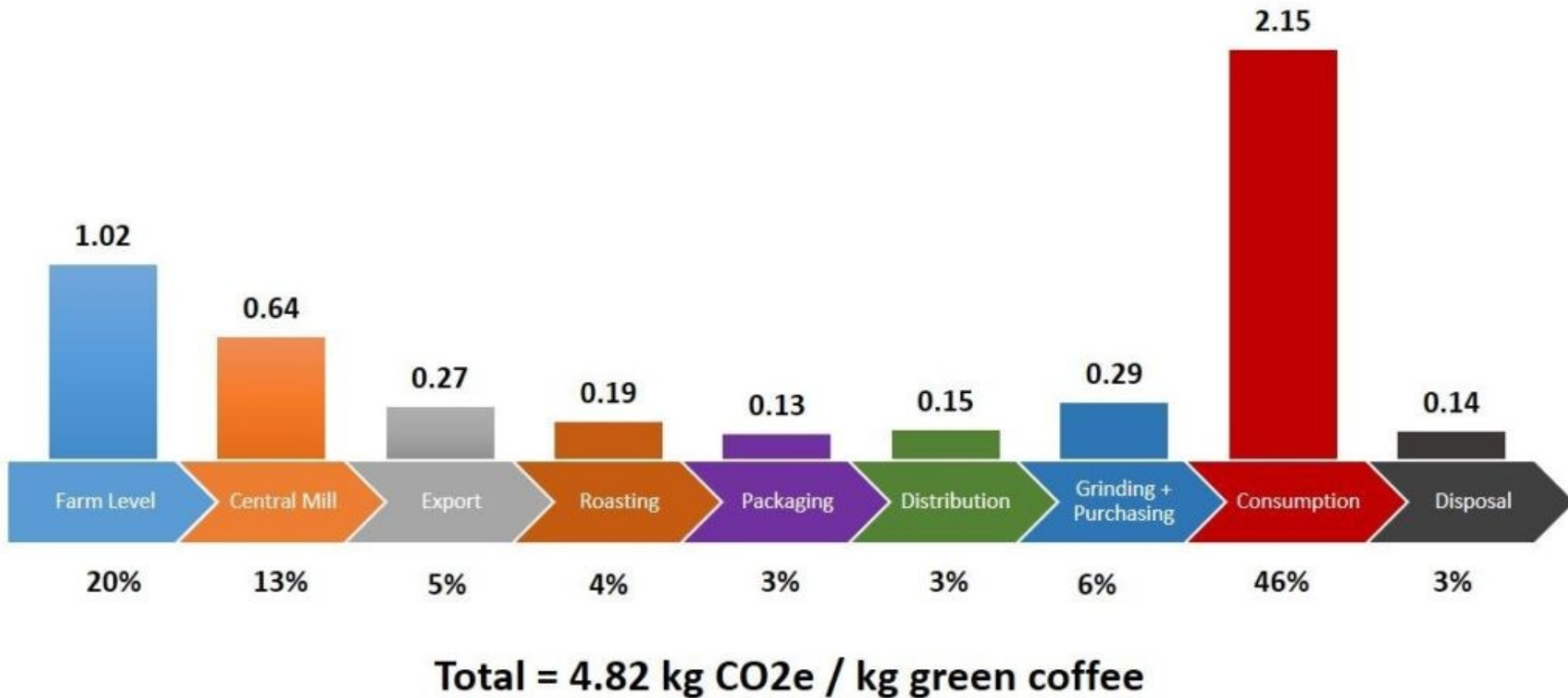
Farmer data collection



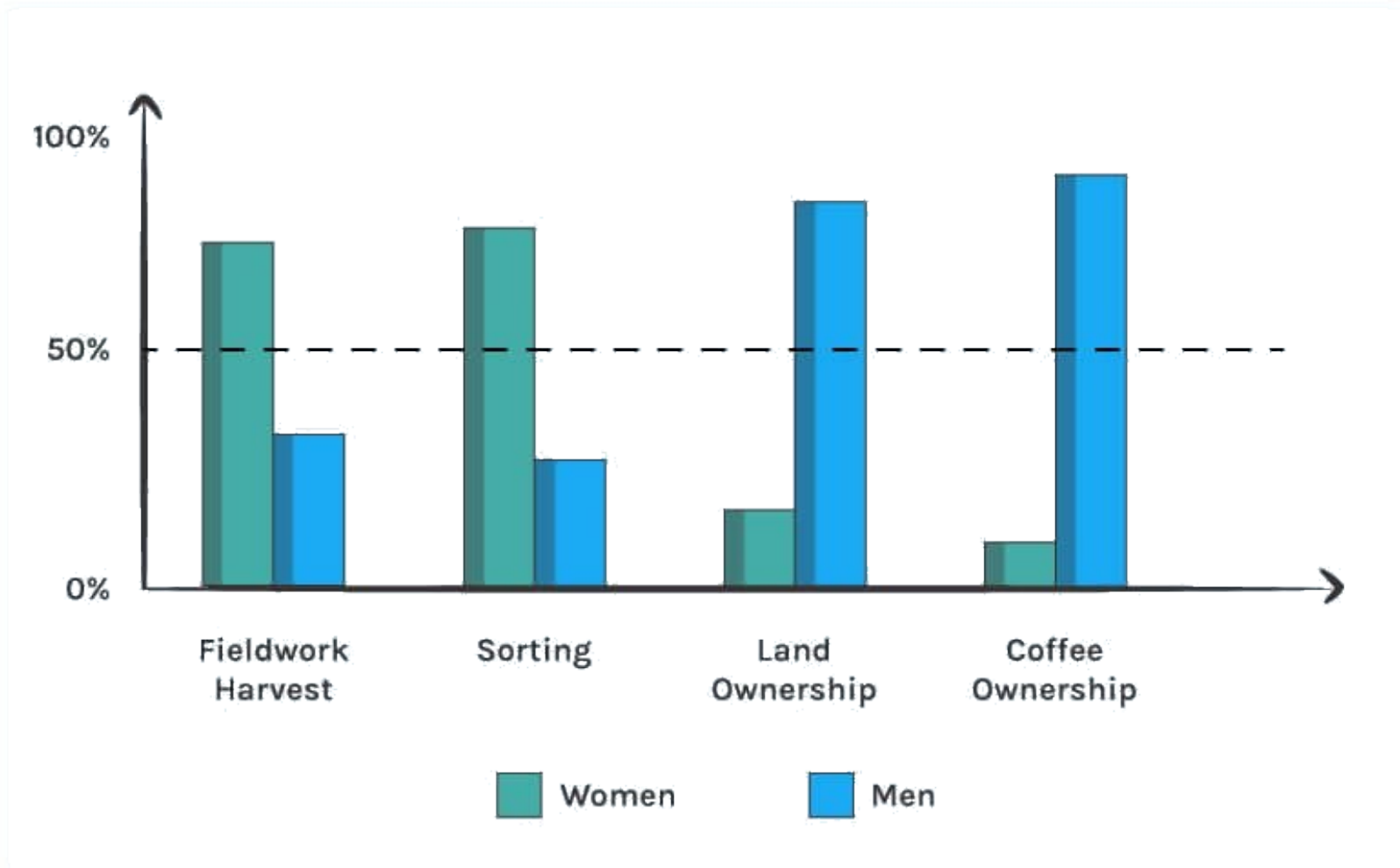
Climate change



Carbon footprint

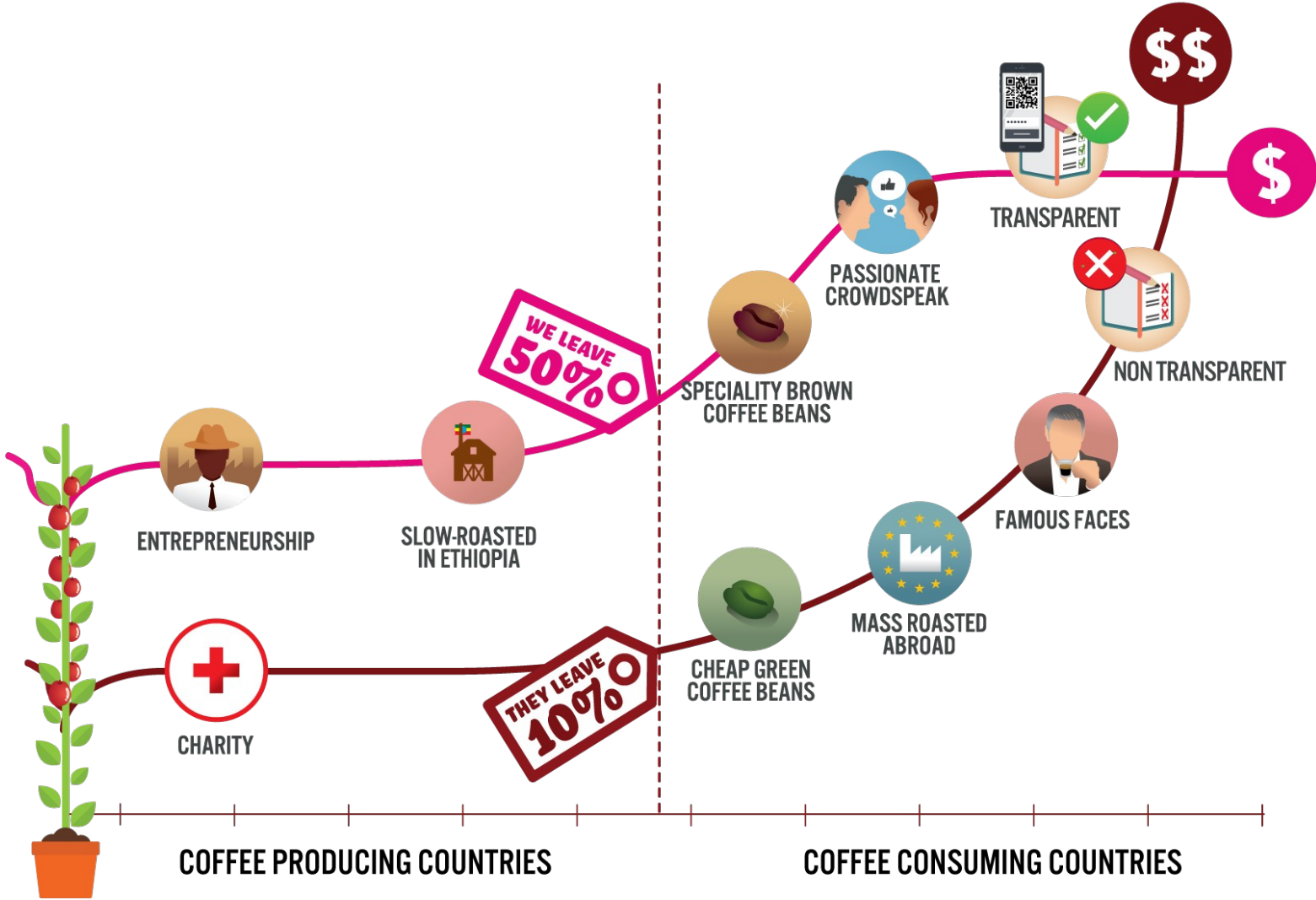


Gender roles



<https://www.homegrounds.co/women-in-the-coffee-industry/>

Equity and transparency



Geopolitical impacts on coffee

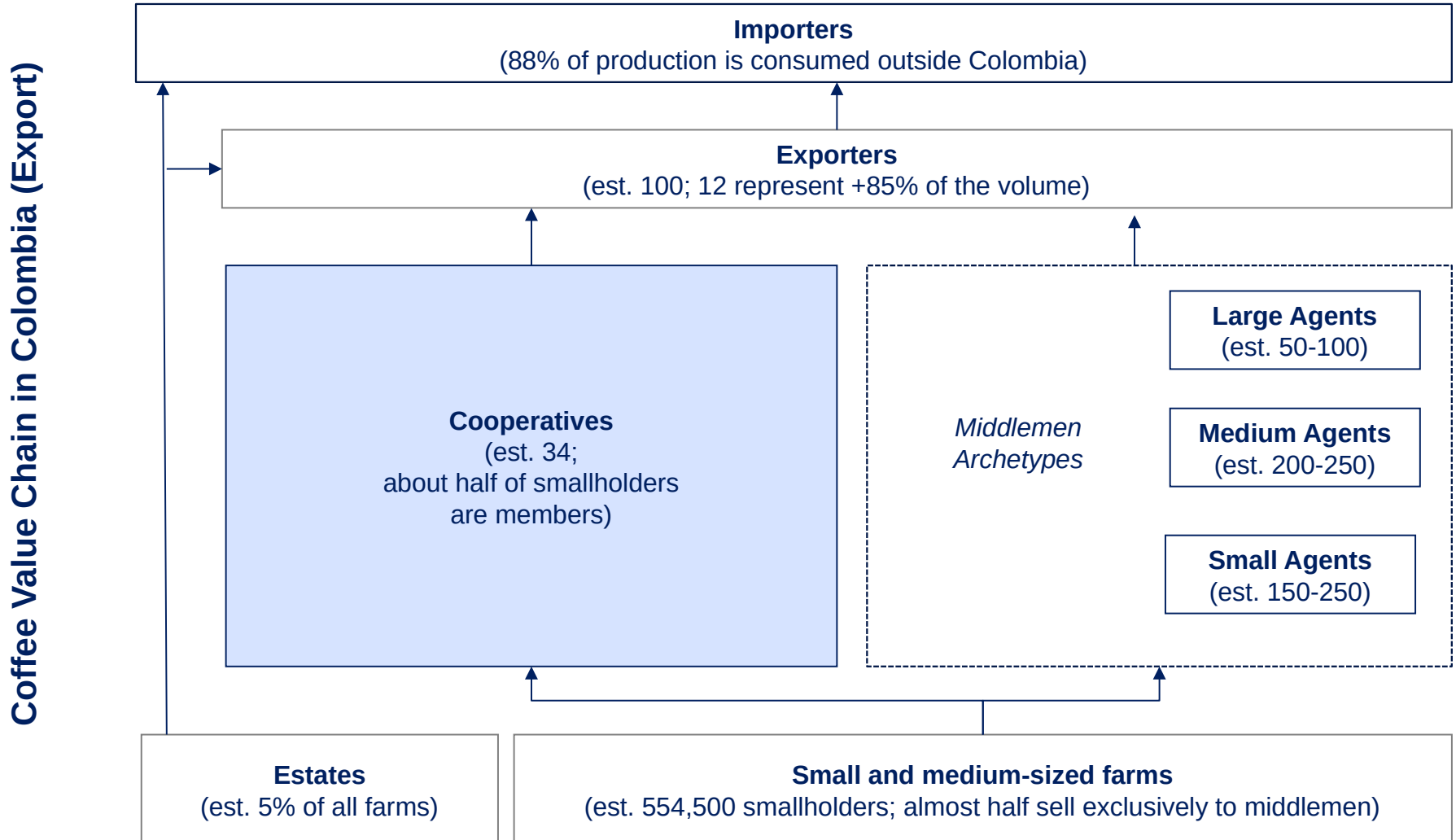


<https://farmpolicynews.illinois.edu/2022/03/fertilizer-prices-break-new-records-in-conjunction-with-elevated-commodity-prices-stir-food-security-concerns/>

Plan for today

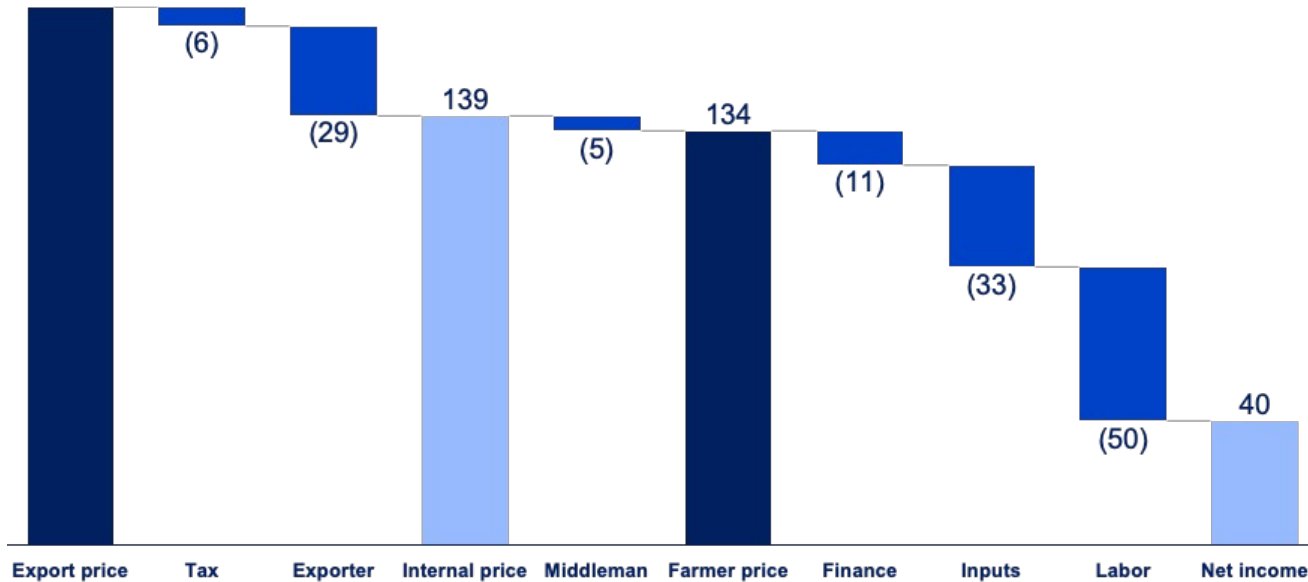
- Panel Discussion
- **Case Study: Colombia**
- Practical Advice

Colombia has ~550,000 coffee farmers and a strong cooperative sector



Colombian farmers earn 80% of the export price

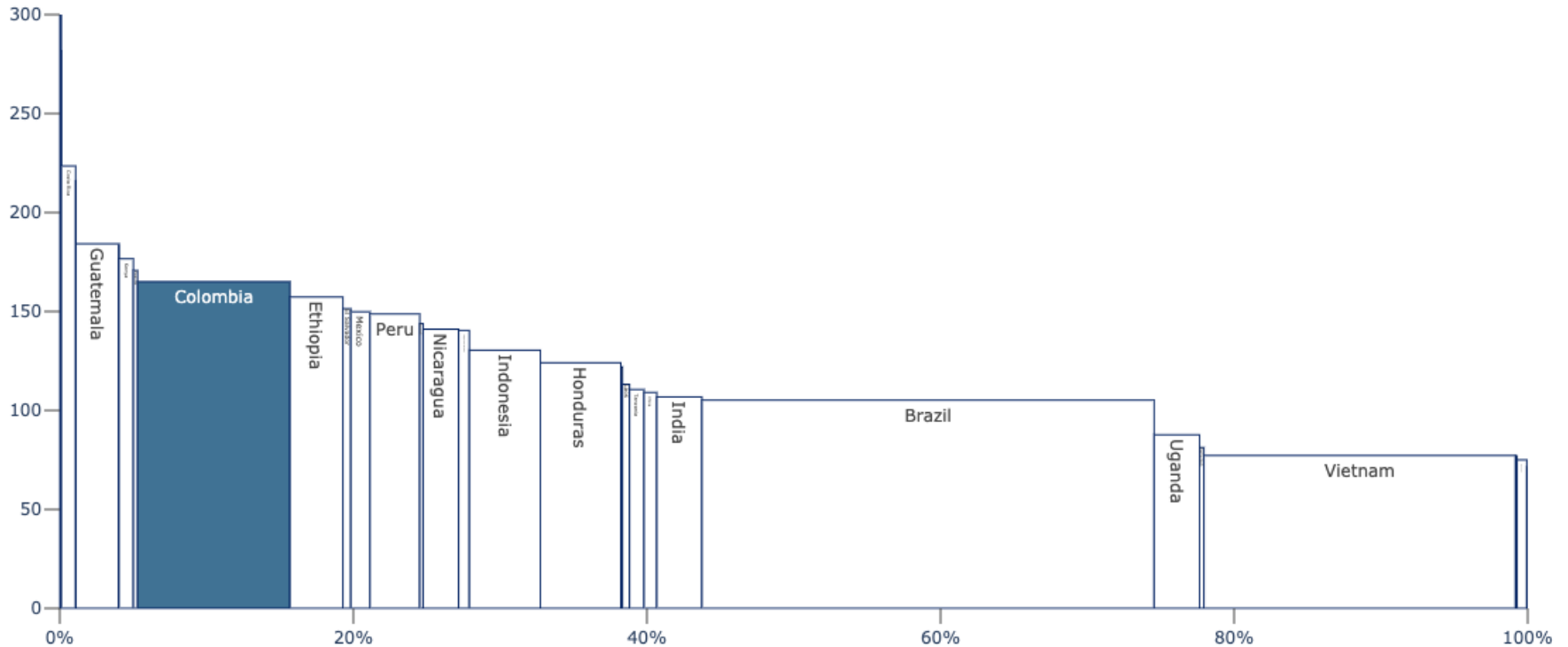
Illustrative Colombia Arabica supply chain cost breakdown
US cents per pound green



Note: Cost of production does not include costs for installation of wet milling equipment, tree renovation or financing
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** Includes farm tools, equipment, internal transport, etc.
Source: Stakeholder interviews, TechnoServe analysis

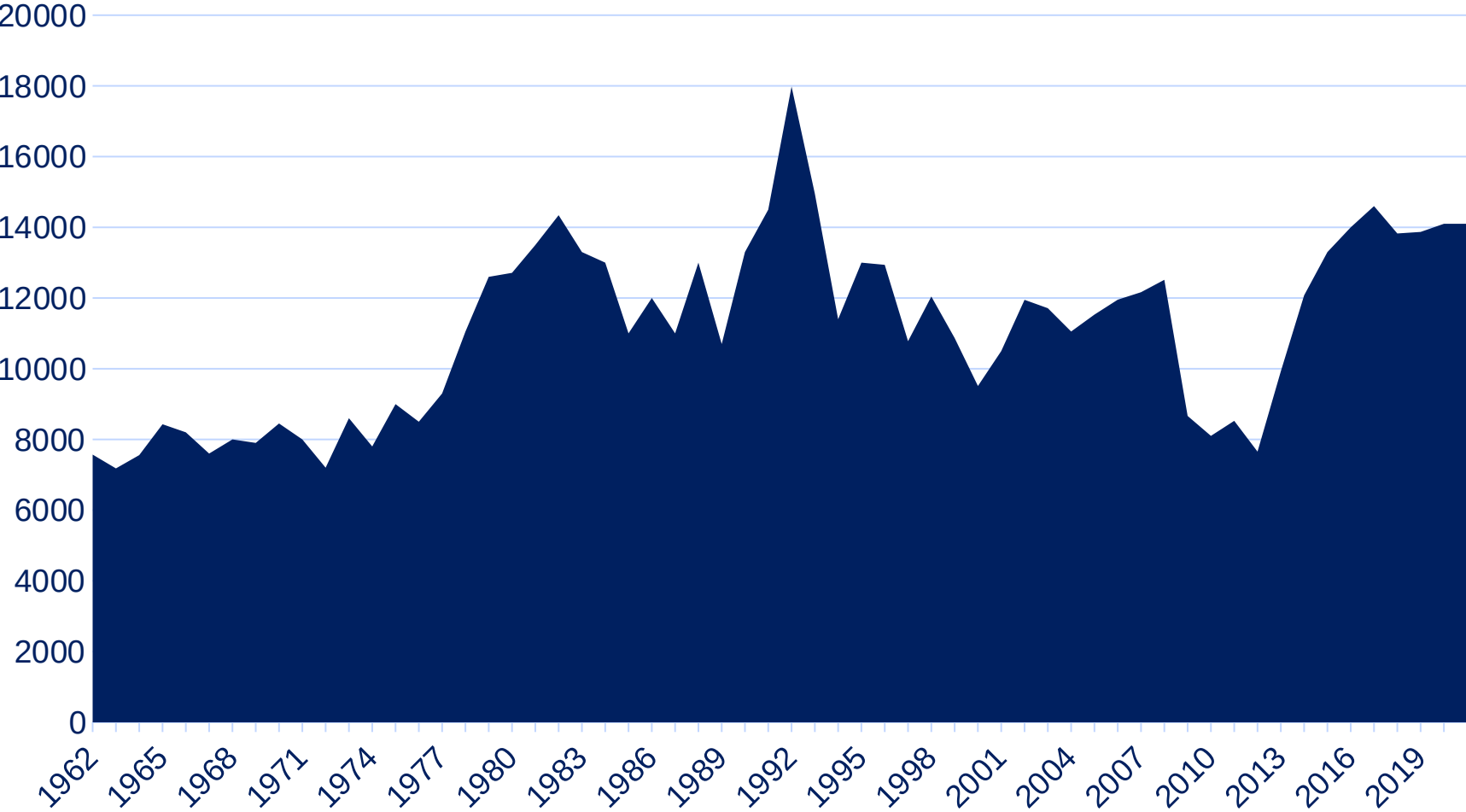
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Colombia coffee production
Bags (60-kg), millions

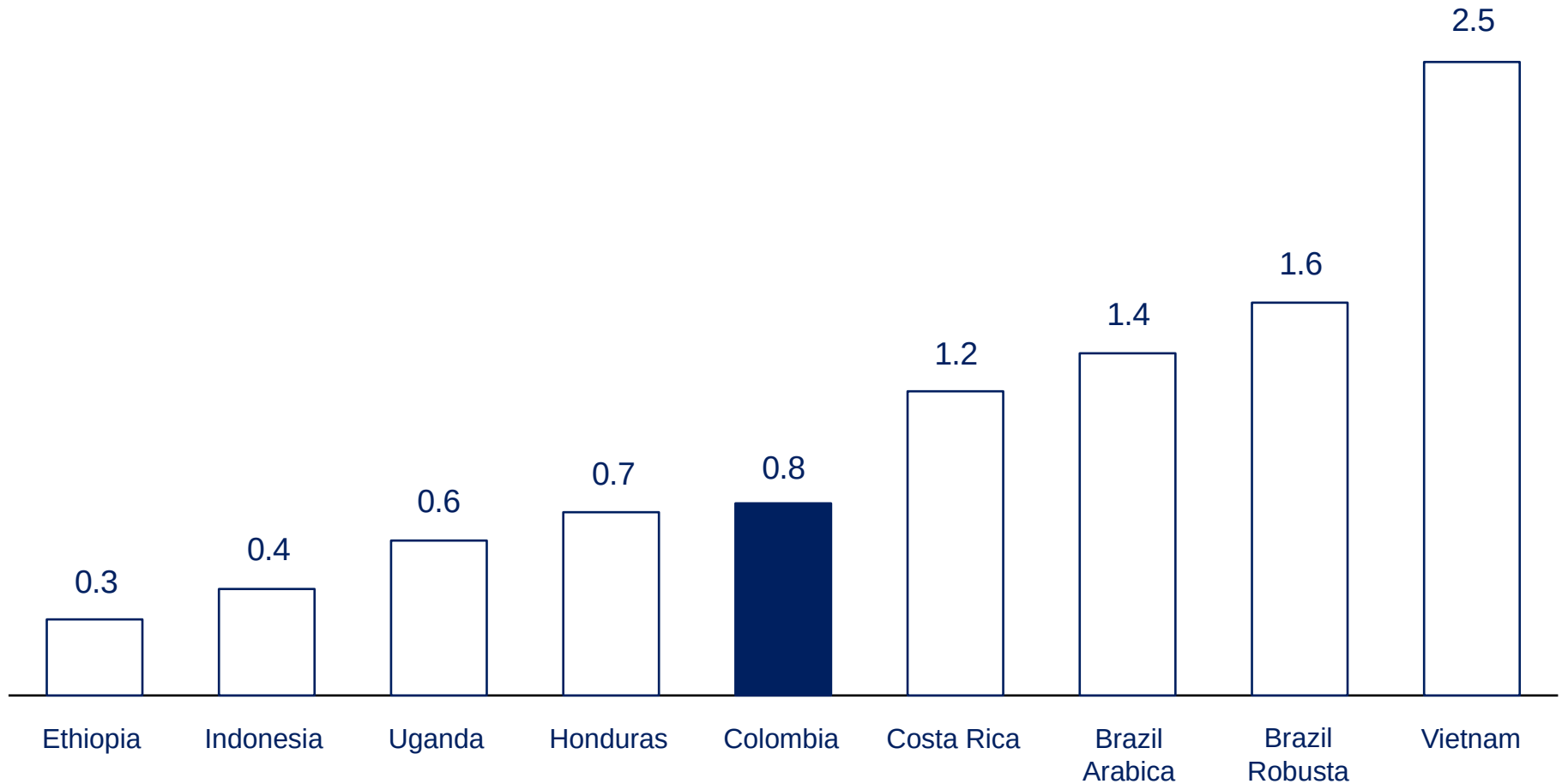


Source: USDA production figures

Colombian farms have average level yields

Average coffee farm yields*

Metric tons green coffee per hectare

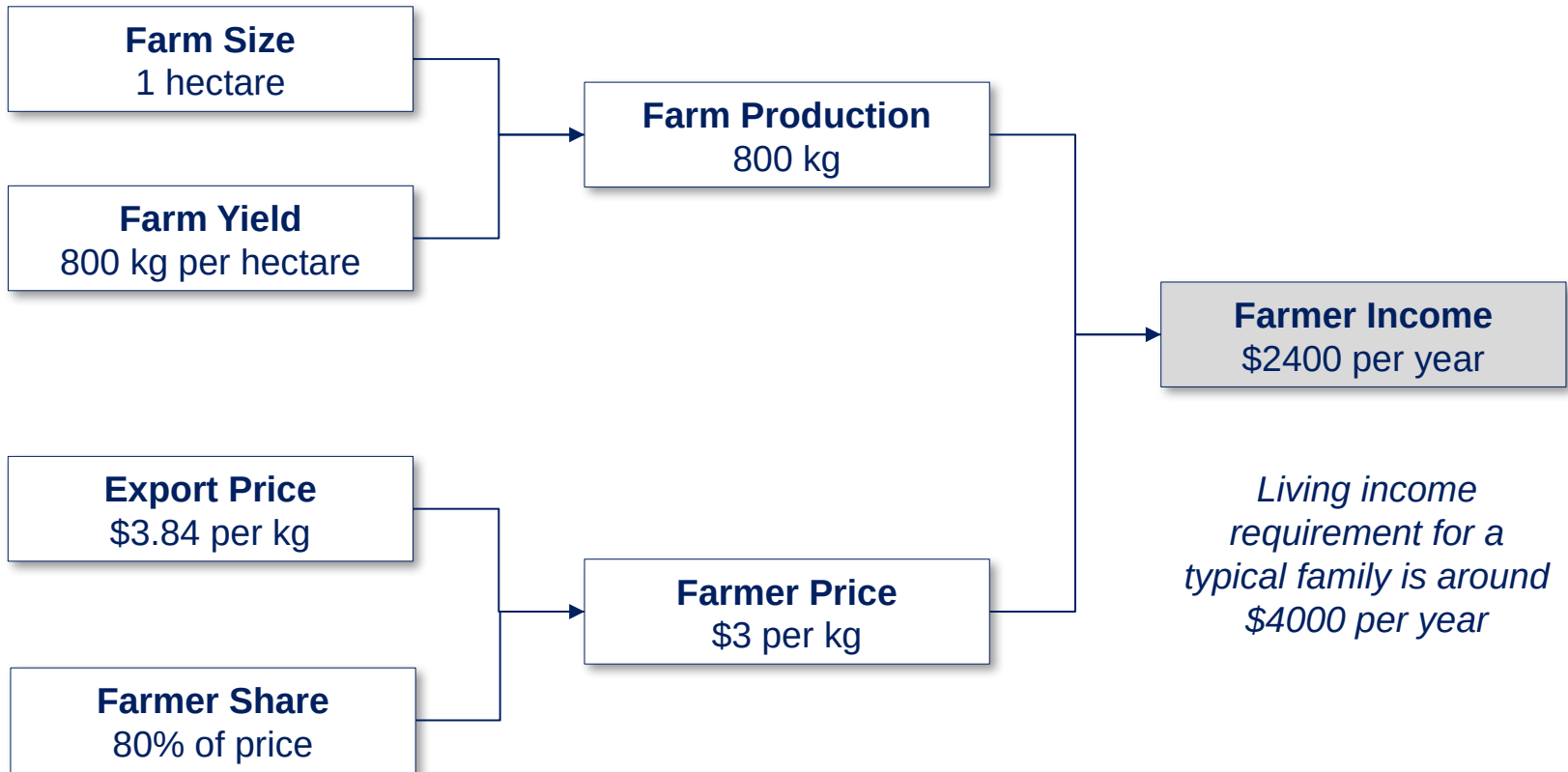


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Source: USDA; TechnoServe analysis

Many Colombian farms struggle to earn a living income from coffee

SIMPLIFIED MODEL



Colombia review

1

MAP

- Approx. 500,000 mostly small-scale farmers
- Unique supply chain with mix of private, public and cooperative operators

2

BREAKDOWN

- Farmers earn 80% of export price
- Strong cooperative sector and institutional support provided by government (through tax)

3

BENCHMARK

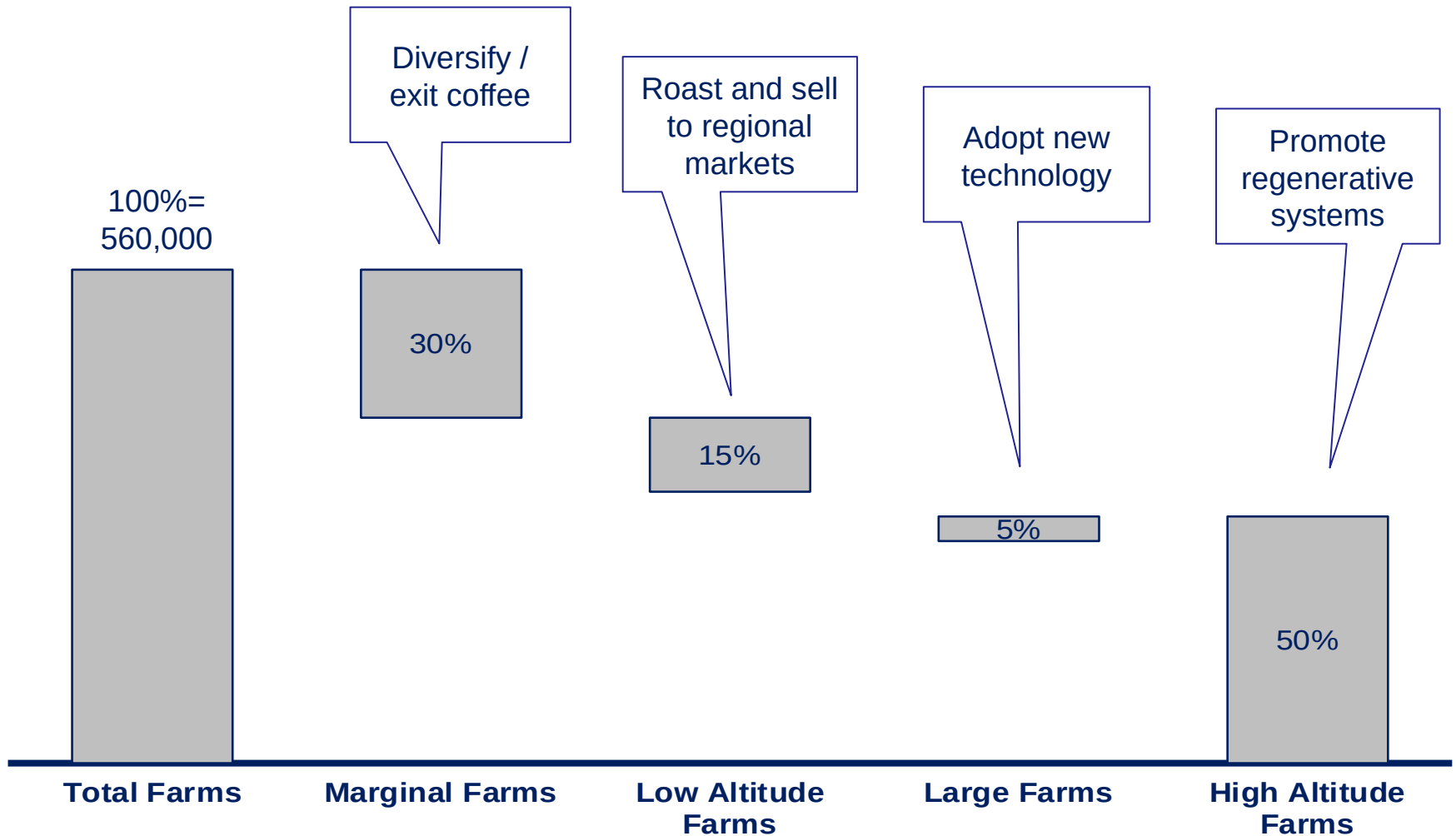
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Recommendations for Colombia's coffee value chain

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		Low	High

Feasibility

Recommendations can also be segmented by producer type



Plan for today

- Panel Discussion
- Case Study: Colombia
- **Practical Advice**

Some pointers when doing VCA in the real world

- Context, context, context
- Identify the right mix of stakeholders to interview
- Get diverse opinions
- Make it easy for people to give you data (e.g., carry a USB)
- Know that official statistics aren't always accurate
- Corroborate numbers with different sources
- Be OK going downstream (start at farm) and upstream (start at buyer)
- Talk through hypotheses with experts
- One-size-fits-all solutions are rare; segmentation is usually needed
- Keep slides simple