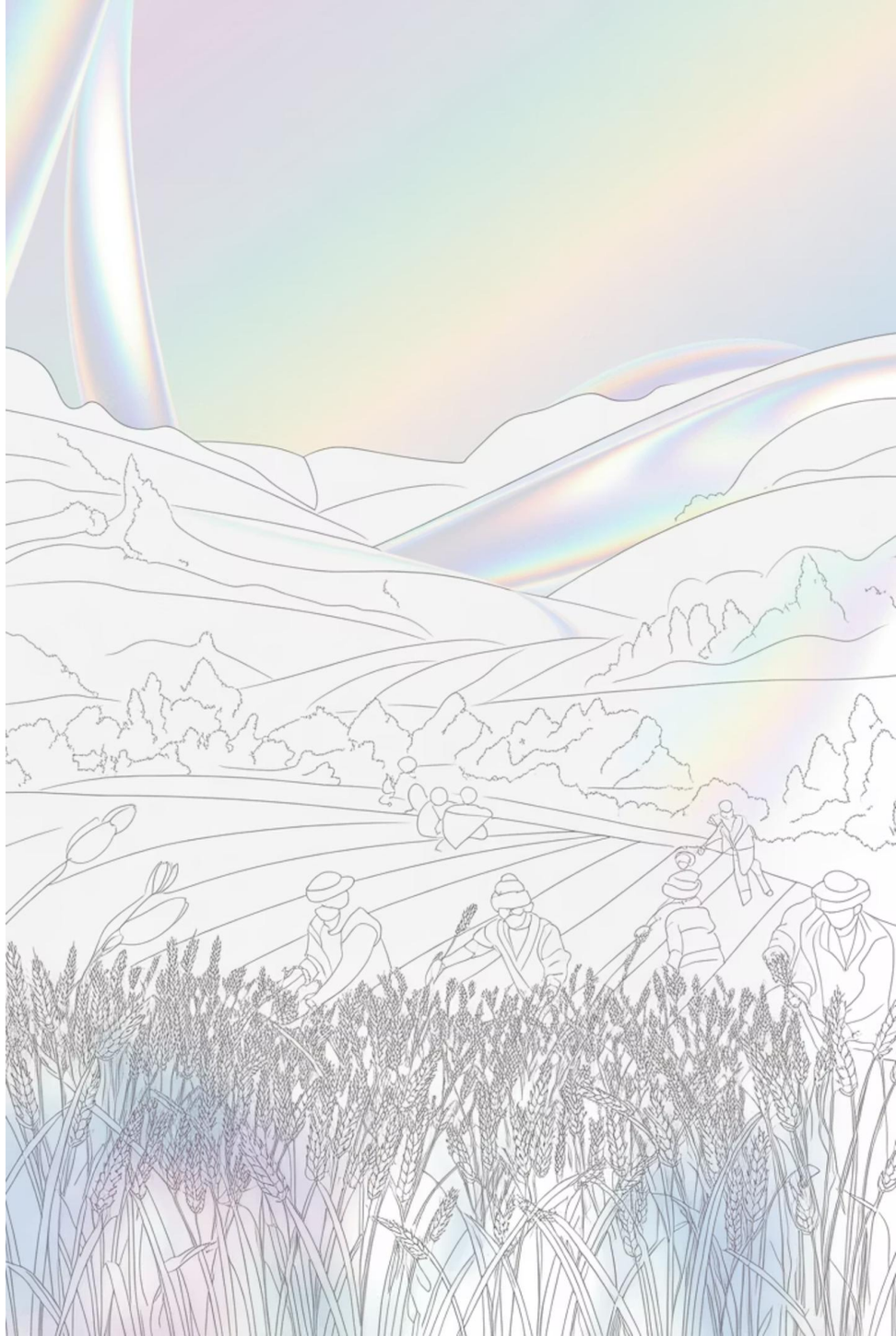
The Teff Value Chain: Evidence from Ethiopia

A comprehensive study examining how Ethiopia's most important staple crop moves from rural farms to urban consumers, challenging conventional wisdom about African food supply chains.



Africa's Urban Food Challenge Challenge

Rapid Urbanization

Africa's urban population is rising quickly, projected to reach ~60% urban by 2050. This explosive growth fuels concern over how to feed growing cities efficiently and affordably.

Policymakers often blame inefficient domestic value chains for high food prices and increased dependence on imports, yet few rigorous studies have examined how these local food chains actually function.

The Teff Case Study

This research investigates the rural-to-urban teff supply chain in Ethiopia, following the country's most important staple crop from farmers in major producing zones to consumers in Addis Ababa.

By analyzing this value chain, the study provides evidence on market functioning and value distribution for a key African staple.

Research Questions

01

Value Chain Structure

How is the teff value chain organized? How many intermediaries exist between farmer and consumer? What fraction of the consumer price do farmers receive versus traders and millers?

02

Spatial Dynamics

Do farmers far from Addis Ababa receive much lower prices due to transport costs or exploitation, or do prices adjust efficiently with distance?

03

Temporal Patterns

How do prices and sales vary through the year? Is there a glut right after harvest causing price crashes? Do farmers resort to distress selling to meet cash needs?

04

Challenging Assumptions

Do small farmers capture only a tiny share of final price? Do staple markets involve "many layers" of middlemen? Must farmers sell immediately after harvest at low prices?

Comprehensive Data Collection

1,800

Total Interviews

Primary survey interviews conducted across all stages of the teff value chain in late 2012.

1,200

Teff Farmers

Surveyed across 5 major production zones, representing ~42% of national teff area and commercial surplus.

282

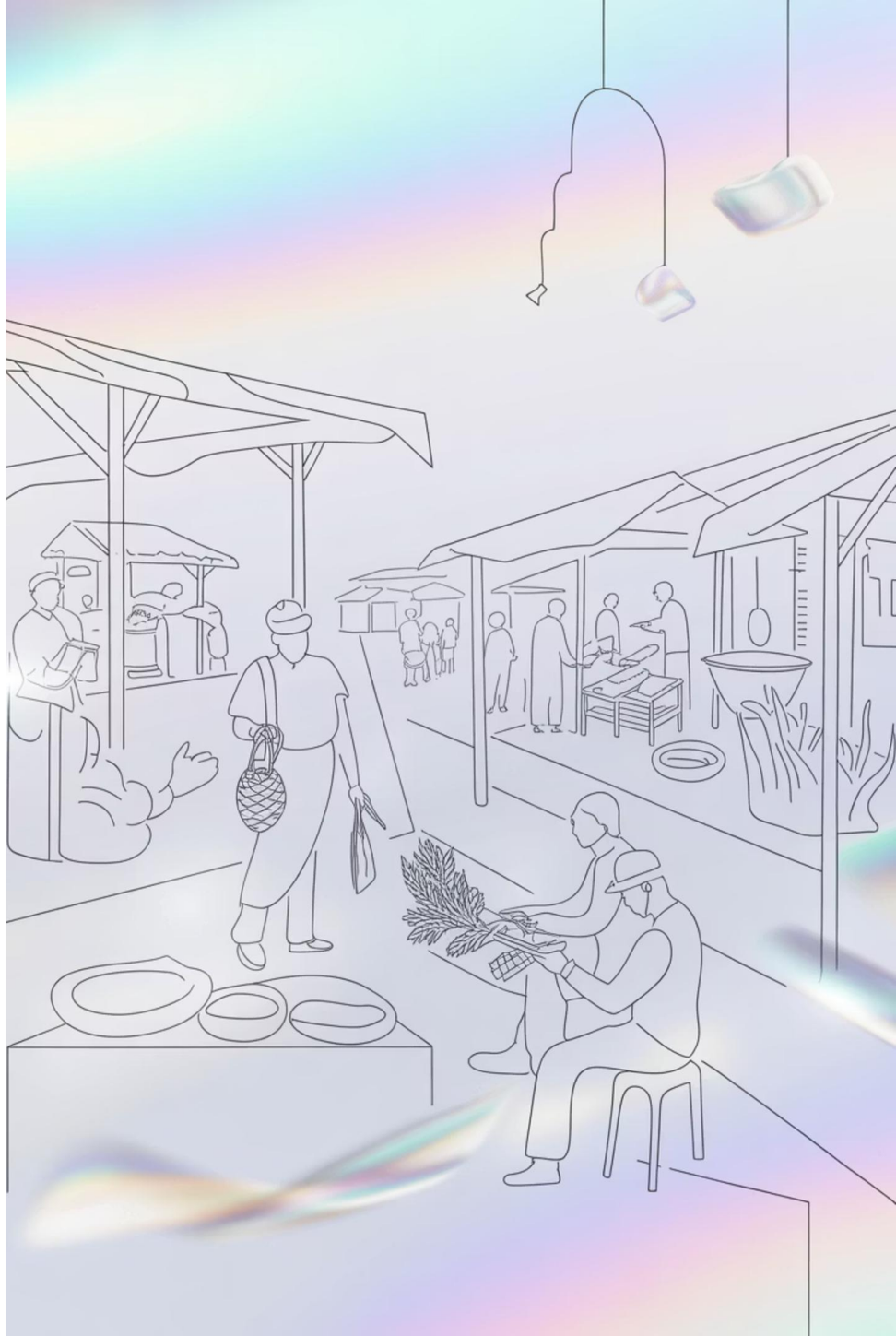
Retail Outlets

Stratified random survey of teff retailers in Addis Ababa, including shops, mills, and cooperatives.

200+

Traders & Drivers

Rural wholesalers, urban traders, brokers, and truck drivers moving teff to the capital.



Multi-Stage Sampling Strategy

Production Zones

Selected top 5 teff-producing zones accounting for 42% of national area

Districts & Villages

Multi-stage random sampling of woredas and kebeles within each zone

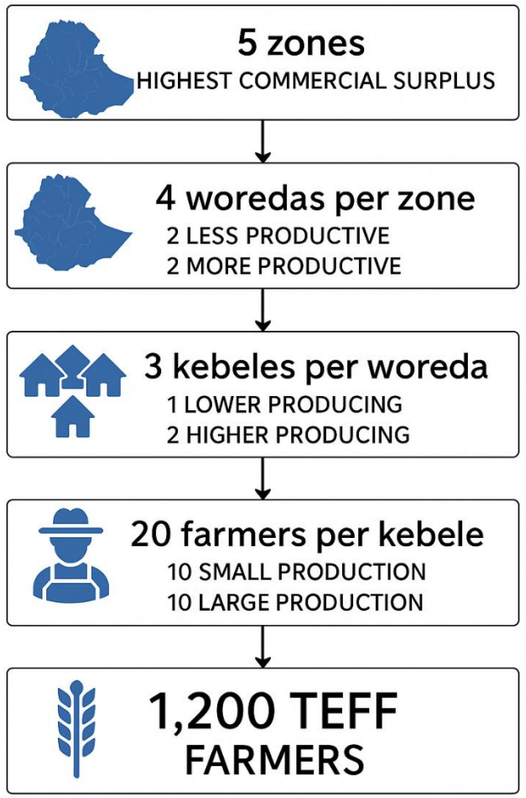
Farmer Selection

Stratified by farm size, 240 farmers per zone randomly chosen

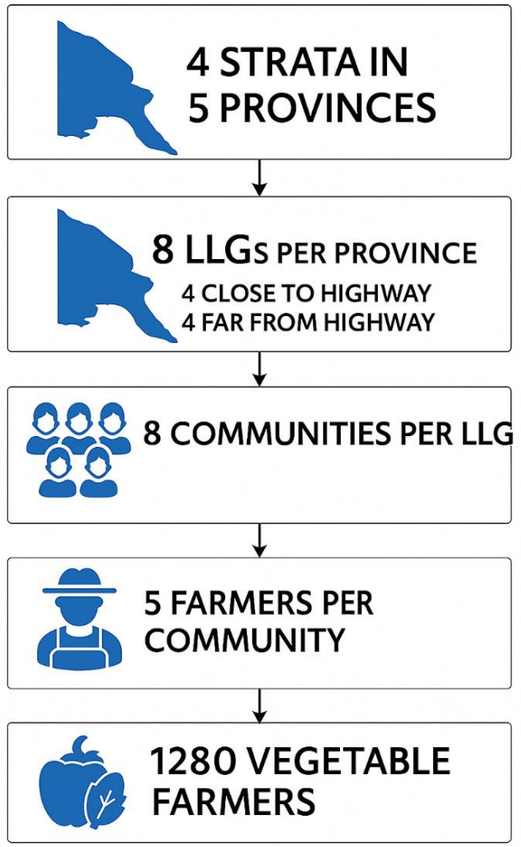
Supply Chain Actors

Traders, drivers, and retailers surveyed at key market points

Ethiopia Teff



PNG Vegetable (ongoing work)



Analytical Approach

Mapping the Chain

Researchers traced who buys from whom by asking traders and retailers about their sources and buyers. This reconstructed typical supply chain paths and quantified intermediary nodes.

Seasonal Analysis

Gathered data on farmer storage and sales throughout the year. Analyzed 10 years of monthly price data using regression models with seasonal dummy variables.

Price & Margin Analysis

Collected price data at each stage to compute value distribution. Linked farm prices, wholesale prices, and retail prices for the same quality and origin to calculate marketing margins and farmer's share.

Spatial Analysis

Examined how prices vary by location and distance from Addis Ababa. Regression models isolated the impact of remoteness on prices after accounting for quality and timing.

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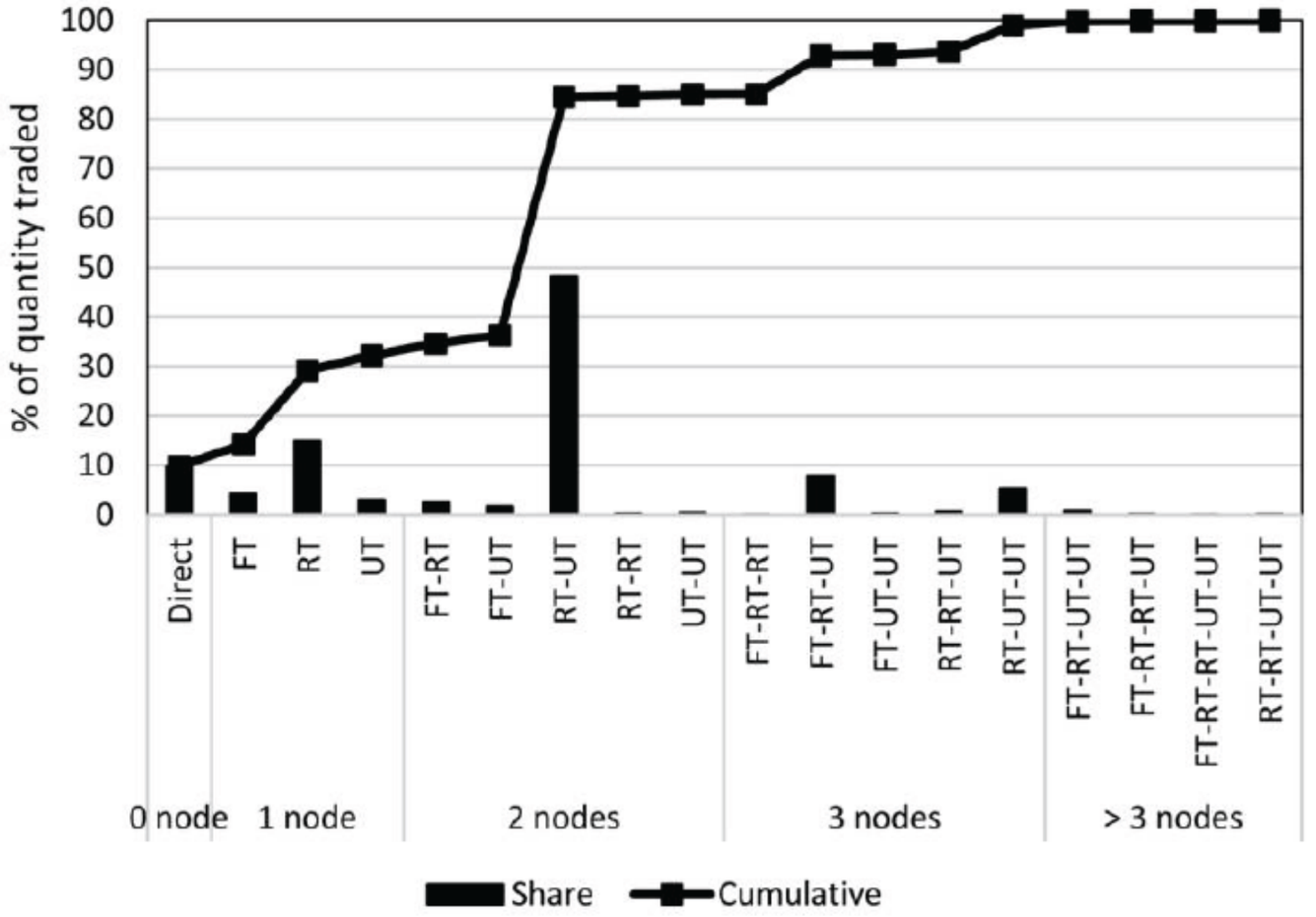
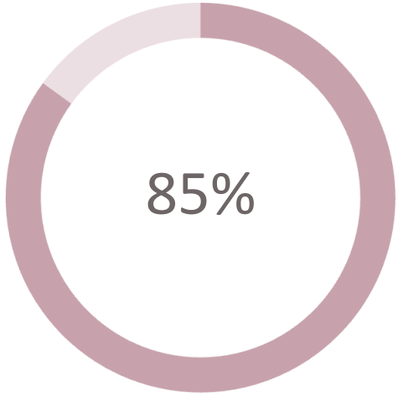


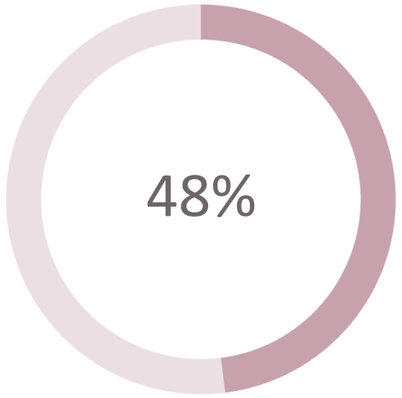
Figure 1. Prevalence of different value chain structures between urban teff retailers and farmers. FT = farmer-trader; RT = rural trader; UT = urban trader. Source: Teff trader surveys.

Value Chain Structure: Key Findings



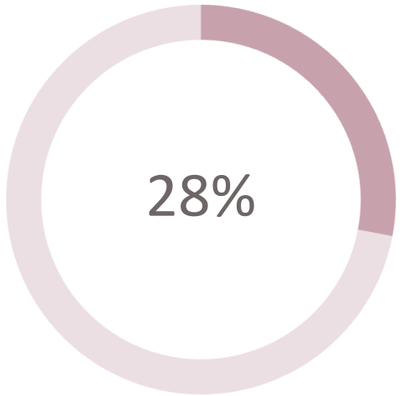
Short Chains

Of teff volumes had two or fewer trade nodes between farmer and urban retailer



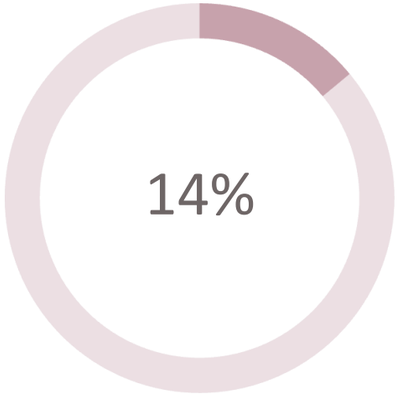
Typical Route

Farmer → Rural Trader → Urban Trader → Retailer (three-step chain)



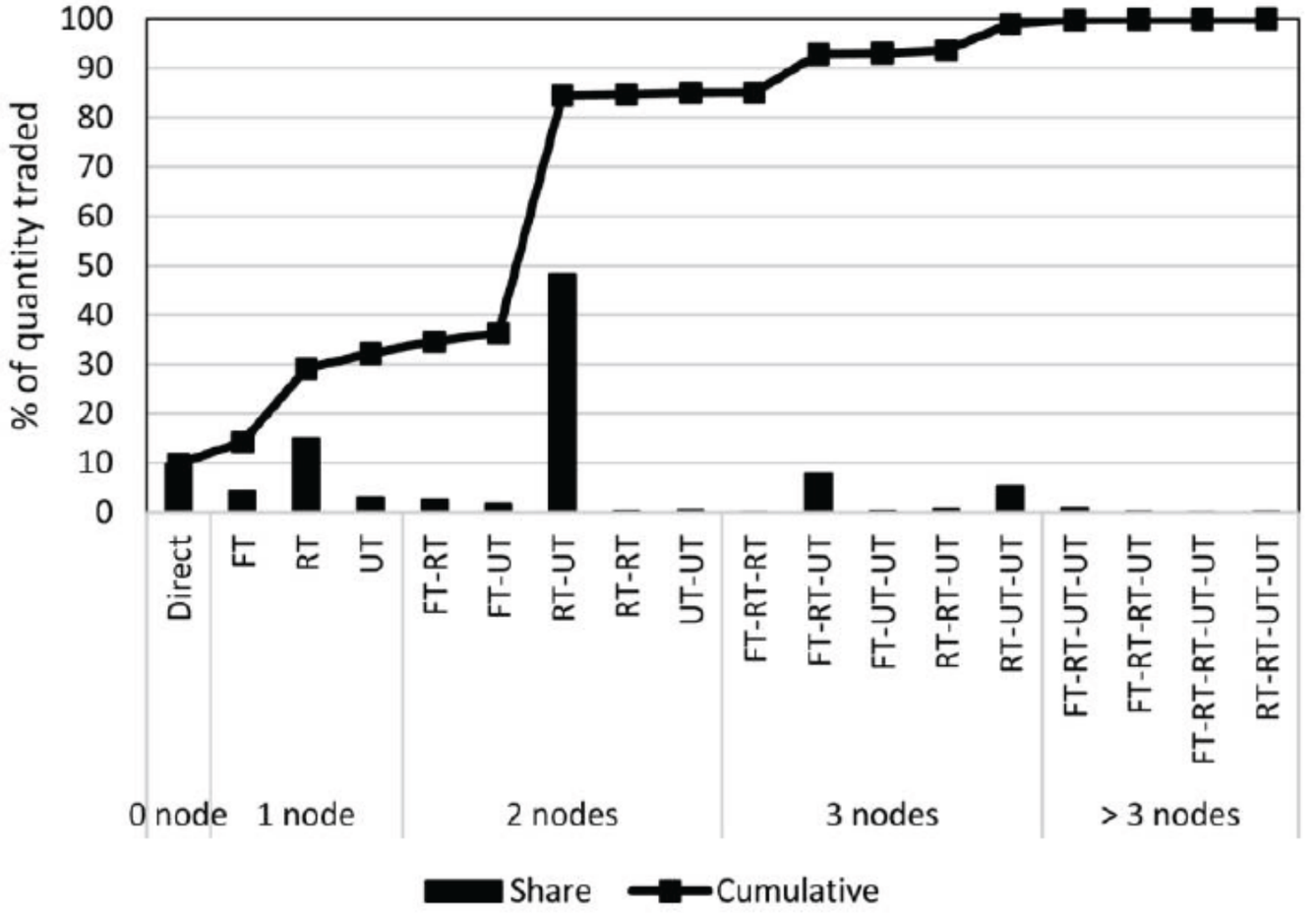
Direct Sales

Of retailers bypass formal wholesalers, sourcing directly from rural markets or farmers



Long Chains

Only this small percentage moved through three or more trader levels



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Challenging Conventional Wisdom

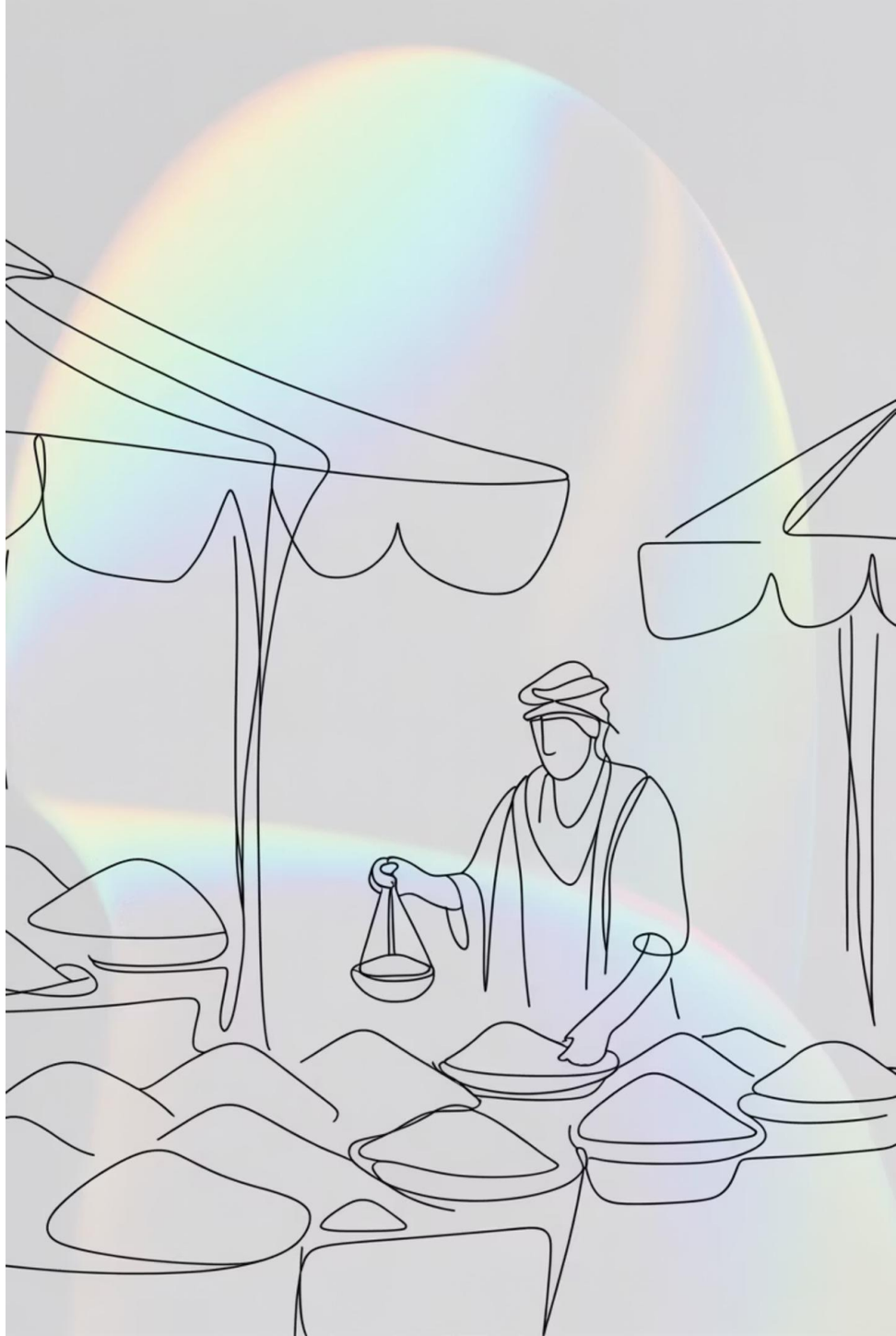
> "These findings directly contradict the conventional wisdom that staple food chains in Africa have 'too many layers' of middlemen. Instead of a fragmented, many-tiered system, teff often travels from farm to city with minimal hand-offs."

The Myth

African staple chains are clogged with excessive intermediaries, each adding markup and driving up consumer prices.

The Reality

Teff moves through a streamlined chain with typically just 1-2 intermediaries, suggesting efficient market organization.



Value Chain Structure: Farmer Participation in Markets

36%

Share Sold

Average portion of harvest sold by farmers

507kg

Volume Sold

Average teff sold per producer annually

60%

White Teff

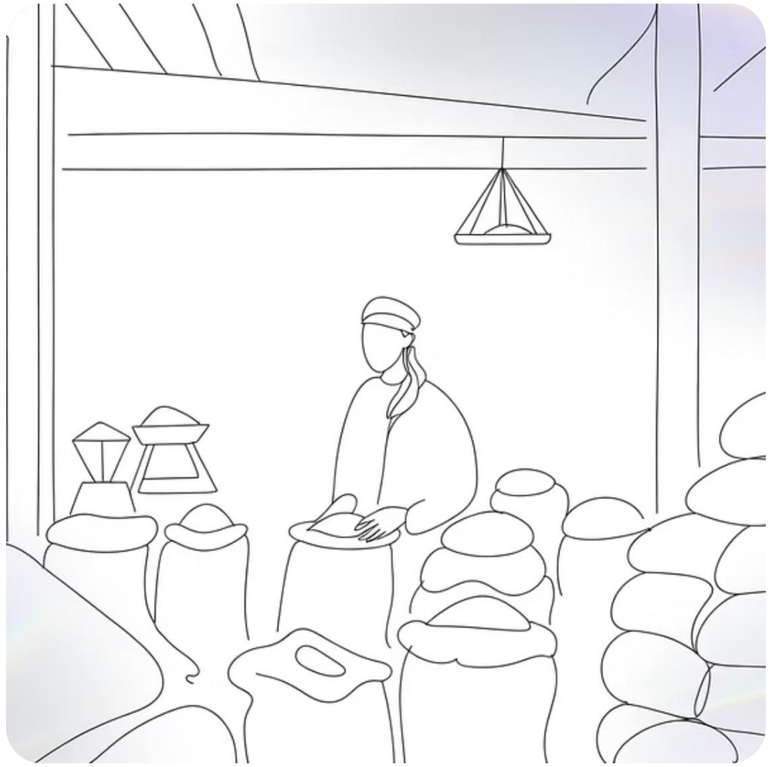
Of grain sold was premium white teff

Partial Commercialization

Teff farmers did not sell their entire harvest. The rest was retained for family consumption, seed for next planting, and possibly local barter or stock. This indicates a semi-subsistence pattern where teff serves both as cash crop and household staple.

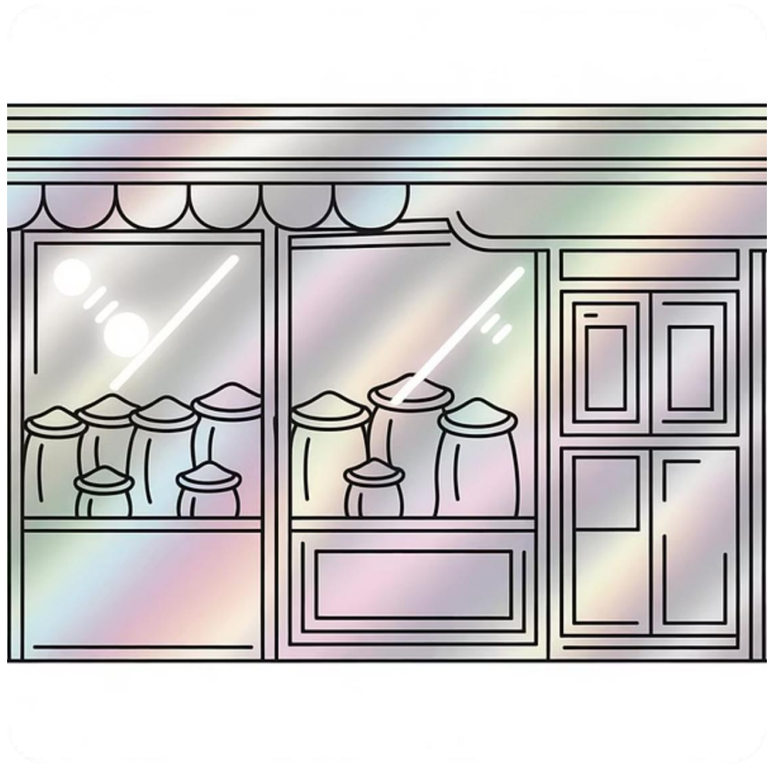
Farmers and traders respond to urban consumers' quality preferences, with a shift toward white teff in the marketed surplus. White teff flour makes preferred white injera, commanding premium prices in urban markets.

Value Chain Structure: Trading & Retail Operations



Urban Wholesalers

Handle ~700 tons of teff per year on average, aggregating massive volumes to supply retailers and institutions.



Retail Shops

Sell ~36 tons annually, catering directly to consumers in smaller quantities for household use.

Transport Network

Truck drivers and rural assemblers bridge production zones and urban markets efficiently.

Value Chain Structure: Market Characteristics

Male-Dominated

95% of rural wholesalers and 100% of urban wholesalers and truck drivers were men. Only ~15% of retail outlets managed by women.

Cash-Based

Most deals done in cash on the spot, with very limited use of credit or pre-harvest contracts. Farmers typically sell and get paid immediately.

Quality Inspection

No standardized grading system. Every trader personally inspects grain quality (purity, color) when buying, checking weight and quality at each handoff.

Low Losses

Minimal spoilage and losses. Teff can be stored for long periods without quality deterioration, keeping supply chain costs down.

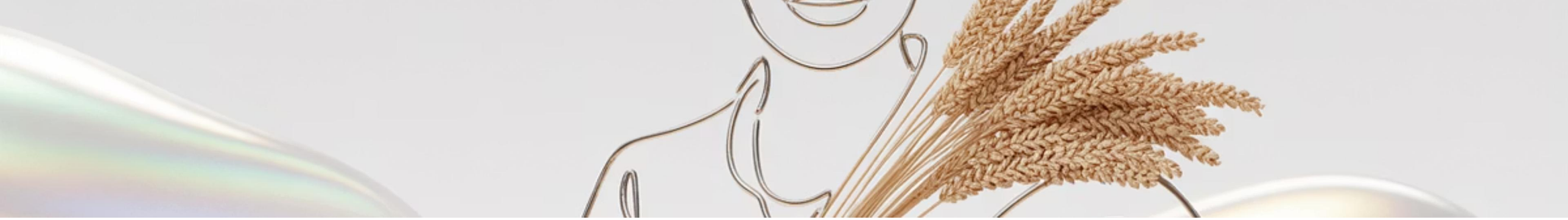
Analytical Approach

Price & Margin Analysis

Collected price data at each stage to compute value distribution. Linked farm prices, wholesale prices, and retail prices for the same quality and origin to calculate marketing margins and farmer's share.

$$p_h = \sum_{k=0}^{N} \beta_{kh} X_h^k + \nu,$$

Level	Source	Unit	Specification 1 Coefficient	Specification 1 *t*-Value
Farmgate sales	Farm survey	Yes = 1	−265.6	−23.02*
Farmgate sales interacted with nearby Addis dummy		Yes = 1		
Rural market procurement	Pooled	Yes = 1	−223.7	−47.50*
Rural market procurement	Farm survey	Yes = 1		
Rural market procurement, interacted with nearby Addis dummy		Yes = 1		
Rural market, shipping to Addis	Rural trader survey	Yes = 1		
Urban wholesale market	Pooled	Yes = 1	−137.0	−33.40*
Urban wholesale market procurement	Rural trader survey	Yes = 1		
Urban wholesale market sales	Urban trader survey	Yes = 1		
Urban retail sales—mills (default)[a]	Urban retailer survey	Yes = 1		
Urban cooperative retail sales	Urban retailer survey	Yes = 1		
Urban cereal shops sales	Urban retailer survey	Yes = 1		
Magna teff (default)		Yes = 1		
White teff		Yes = 1	−95.0	−19.60*
Mixed teff		Yes = 1	−201.5	−37.59*
Red teff		Yes = 1	−419.0	−64.07*
Intercept			1,653.8	404.46*
Woreda fixed effects			No	
N			3,316	
R^2			.67	
Mean squared error			113.34	



Price & Margin Analysis

Farmers Get 80% of Final Price

One of the most striking findings: teff farmers capture about 80% of the final retail price on average, leaving only 20% for all post-farm costs and margins.

Analytical Approach

Seasonal Analysis

Gathered data on farmer storage and sales throughout the year. Analyzed 10 years of monthly price data using regression models with seasonal dummy variables.

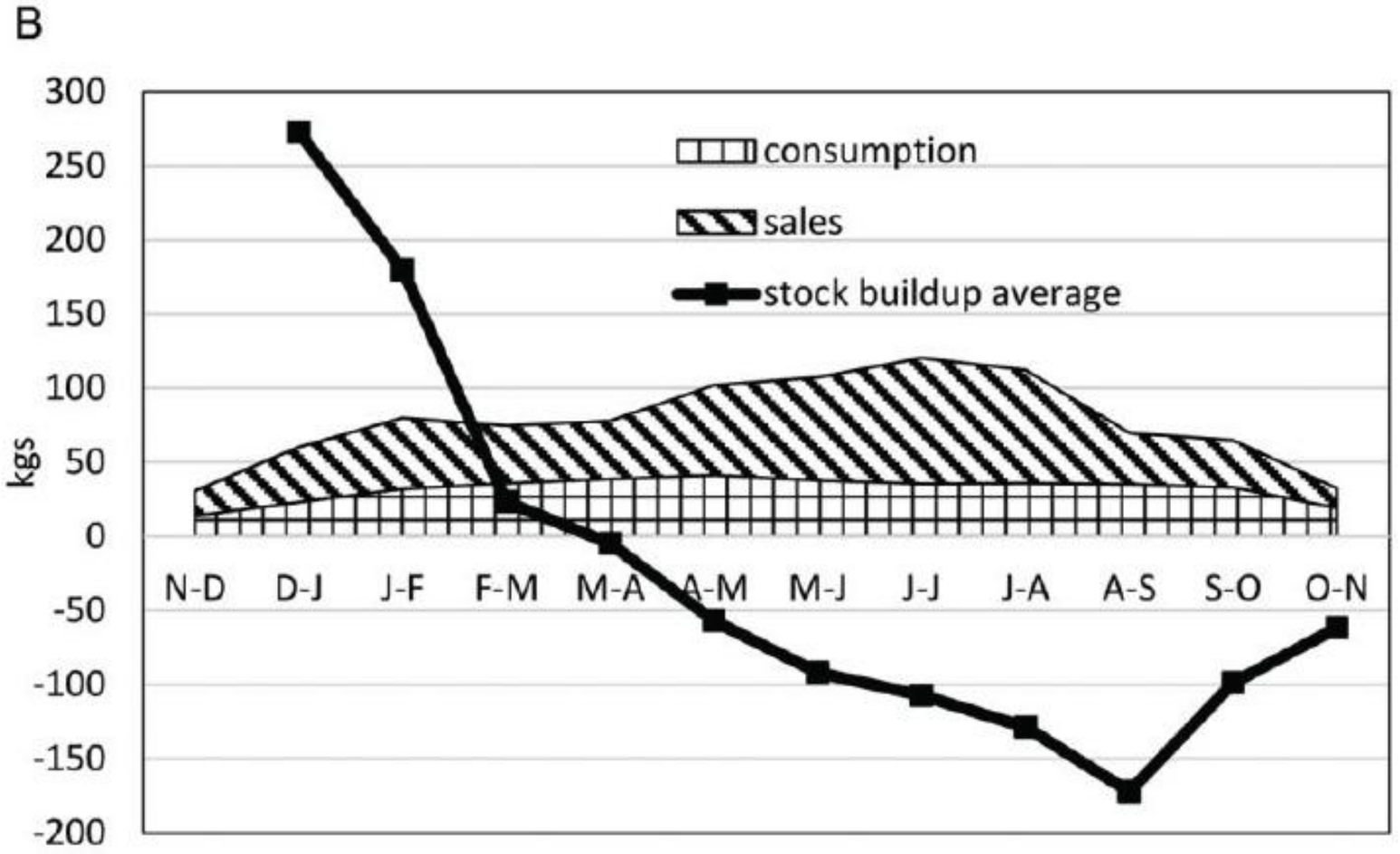
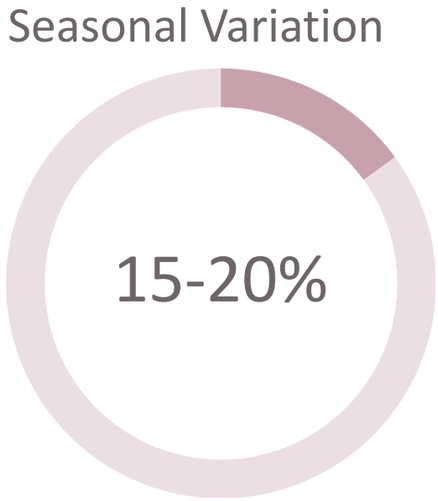


Figure 2. Seasonality in storage (*A*) and average monthly use of teff (*B*). Source: Teff producer survey

Seasonal Analysis

Seasonal Price Patterns

Farmer Storage Behavior



Nov-Feb: Storage Phase

After harvest, farmers build up stocks. Peak consumption at home during this period when food is plentiful.

Mar-Jun: Gradual Release

Farmers start withdrawing from stocks for sale. Household consumption tapers down mid-year.

Jul-Aug: Peak Sales

Highest volume of farmer sales occurs when they need cash for next planting season (buying inputs).

Farmers do not sell all teff immediately at harvest – many hold stocks and release grain gradually, smoothing out supply. This staggered selling helps avoid flooding the market at harvest and contributes to relatively mild price drops post-harvest.

Seasonal Analysis

Limited Distress Selling

The Concern

A common worry is that farmers are forced into selling crops immediately after harvest at low prices due to urgent cash needs – termed "distress sales." This can trap farmers in poverty as they sell low, then later buy food back at higher prices.

The Reality

Only about 19% of sales could be classified as "distress" and ~10% as "extreme distress." Over 70% of sale transactions showed farmers would not have accepted much lower prices just to get cash.

Normal Sales

Farmers sold when and how they wanted, not out of desperation

Distress Sales

Some pressure to sell, might accept ~20% lower price if desperate

Extreme Distress

Truly desperate sales, would accept ~50% lower price

Analytical Approach

Spatial Analysis

Examined how prices vary by location and distance from Addis Ababa. Regression models isolated the impact of remoteness on prices after accounting for quality and timing.

TABLE 8

DETERMINANTS OF TRANSPORTATION COSTS BY TRUCK (BIRR/QUIN

		Trip to Addis Ababa Only	
Explanatory Variable	Unit	Coefficient	*t*-Value
Distance	100 km	13.23	6.97*
Distance^2	100 km	−.45	−1.63
Size of truck	Quintals	−.06	−.81
Road quality (default only paved road):			
Drove on nonpaved road but good quality	Yes = 1	−.17	−.05
Drove on nonpaved bad-quality road	Yes = 1	3.52	1.21
Number of sellers transported for	Number	.09	.77
Number of buyers delivered to	Number	.32	.37
Broker used	Yes = 1	3.55	1.56
To Addis Ababa	Yes = 1		
Intercept		12.68	3.15*
N		101	
R^2		.69	
Root mean squared error		11.46	

Distance Matters, But Fairly

1. **Near City**

   Farmers close to Addis receive over 90% of retail price

2. **Medium Distance**

   Farmers in mid-range zones receive ~85% of retail price

3. **Remote Areas**

   Even distant farmers still receive ~80% of retail price

The farmgate price declines almost exactly in line with the cost of trucking grain to market. If transport costs 10 Birr/kg more from a distant village, the farm price there is about 10 Birr lower than near the city. This pattern suggests spatial pricing efficiency – traders are not taking excessive extra margins from distant farmers beyond higher hauling costs.

Three Myths Debunked

Myth #1: Farmers Get Crumbs

Reality: Farmers capture ~80% of final consumer price, not the 30-50% often cited for African staples. They benefit substantially from final price paid by consumers.

Myth #2: Too Many Middlemen

Reality: Typically only 1-2 intermediaries involved in most cases. The chain is relatively streamlined, not clogged with layers of traders inflating costs.

Myth #3: Pervasive Distress Sales

Reality: Only ~1 out of 5 sales showed signs of financial duress. Most farmers held out for acceptable prices and timed sales strategically.

Why Does Teff Chain Perform Well?

Better Data

Large-scale representative survey captures typical functional situation, unlike limited case studies that may have skewed earlier perceptions.

Recent Improvements

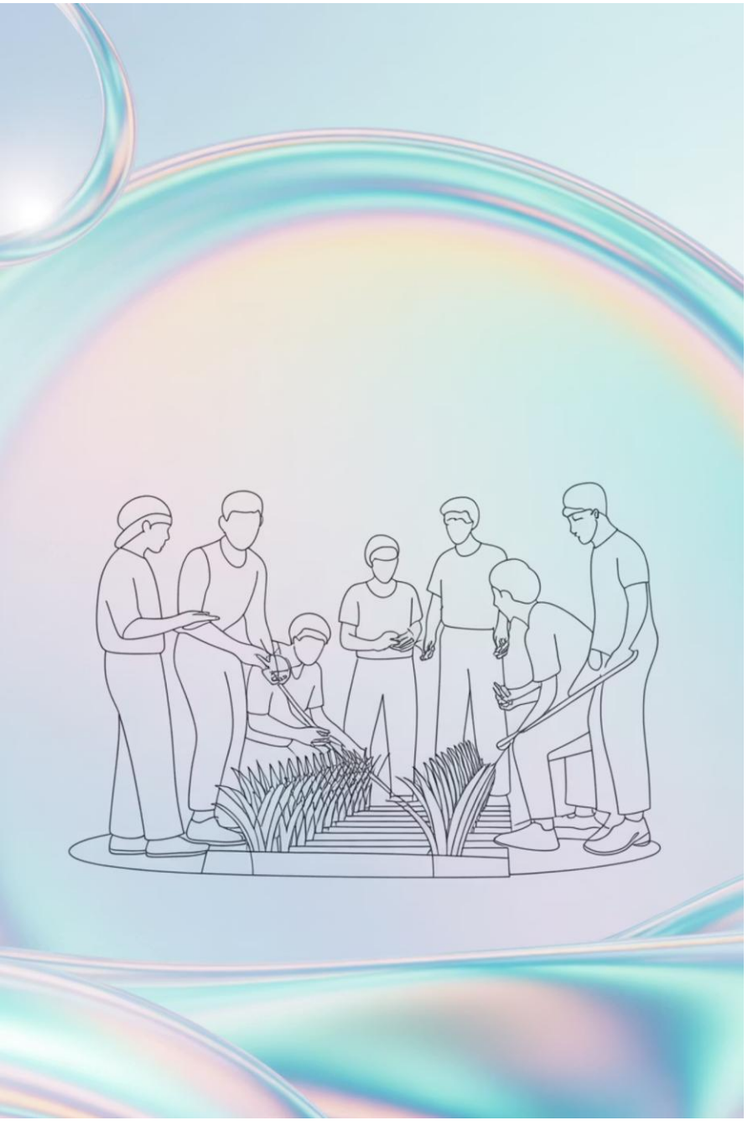
Infrastructure upgrades (roads), mobile phone expansion, and growing urban demand have made markets more efficient in past decade.

Product Characteristics

Teff is non-perishable, durable, relatively high-value per weight, and easy to assess quality – all reducing risks and costs.

Ethiopian Context

Dense network of small towns, pack animals for transport, and high rural population density foster competition and market linkage.



Policy Implications

01

Beware One-Size-Fits-All Fixes

Since teff value chain is already relatively efficient, policymakers should be cautious about interventions aimed at marketing. Reforms should be based on evidence of specific weaknesses, not blanket assumptions.

02

Invest in Infrastructure

Improving rural roads, trucking efficiency, and logistics will directly put more money in remote farmers' pockets and/or lower urban prices. Every Birr cut from transport cost benefits farmers or consumers.

03

Focus on Farm Productivity

Since farmers already receive ~80% of final price, biggest leverage point is increasing farm yields and efficiency. Promote improved varieties, better practices, affordable inputs, and mechanization.

Key Takeaways

1

Efficiency Exists

Ethiopia's teff value chain demonstrates that domestic staple food chains in Africa can function fairly efficiently and inclusively, defying pessimistic stereotypes.

2

Context Matters

Findings are crop and context-specific. Other value chains may behave differently. More comprehensive studies needed for other crops and countries.

3

Evidence-Based Policy

Base policies on data, not assumptions. For teff, focus on farm productivity and infrastructure rather than re-engineering markets that already work reasonably well.

4

Success Is Possible

With right conditions, smallholder systems can deliver results comparable to more advanced markets, serving both farmers and consumers effectively.