Eastern Indonesia-Agribusiness Development Opportunities

Synthesis Workshop
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Ubud, Bali, Indonesia

Australian Government
Australian Centre for International Agricultural Research

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Collins Higgins Consulting

Focus of Workshop Presentations

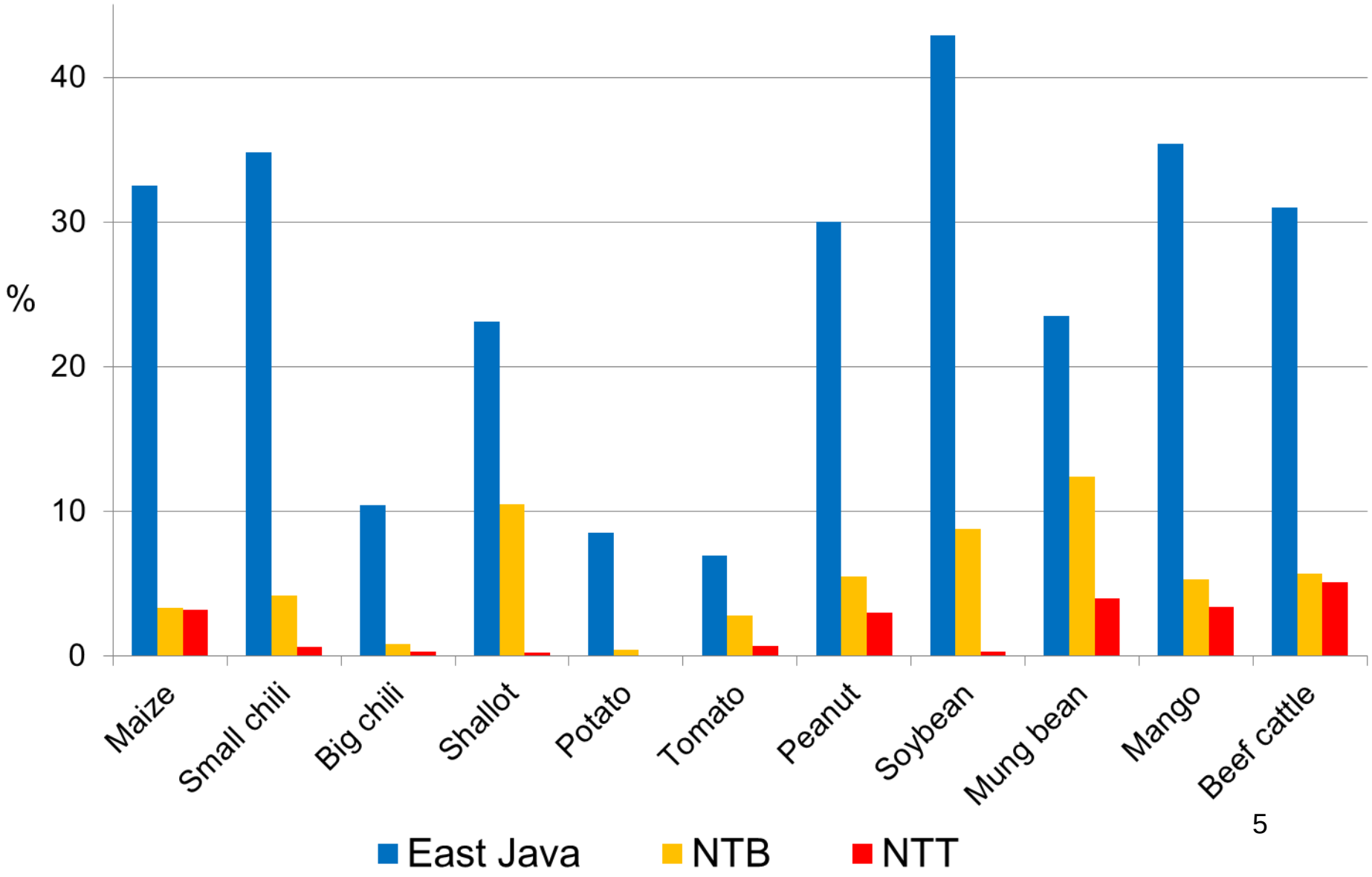
1. Comparative perspective on EI-ADO value chains
2. Lessons and implications for pro-poor chain development

Structure of the Presentation

1. Sub-sector context
2. Chain structure
3. Chain conduct
4. Chain performance
5. Opportunities for pro-poor impact
6. Lessons and strategic implications

1. Sub-Sector Context

Share of East Java, NTB and NTT in National Production (2010-12)



Socio-Economic Relevance

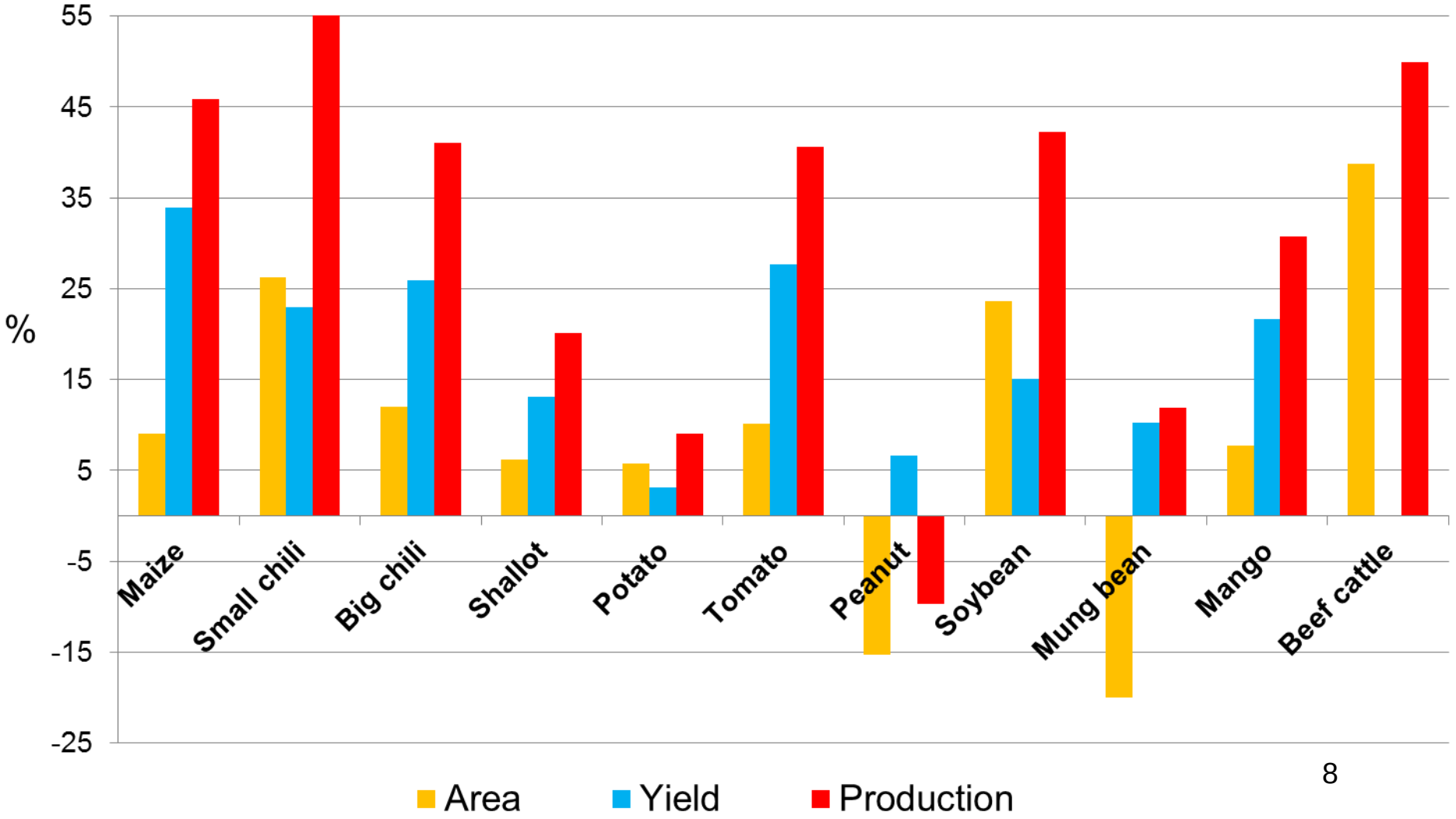
	East Java		NTB		NTT	
	Province	AIPD districts	Province	AIPD districts	Province	AIPD districts
Cattle	***	***	***	***	***	*
Maize	***	***	***	**	***	***
Soybean	***	**	***	***		
Chilli	***	**	*			
Shallot	**	*	**			
Mango	***	*	**	*	*	n.a.
Peanut	***	*	*	*		
Potato	*	*				
Tomato	*	*				
Mung bean	**	*	*	*	*	

Implications: EI-ADO District Portfolios by Chain

	Possible district choices	Some possible district choices
Cattle	Sampang, Situbondo, Malang, Trenggalek, West Lombok, North Lombok, Bima, Dompu, TTU	
Maize	Sampang, Situbondo, Malang, Trenggalek, West Lombok, North Lombok, Bima, Dompu, TTU, East Flores, Ngada	
Soybean	Sampang, Bima, Dompu	
Peanut	Trenggalek, Sampang, Bima	Tuban, Pamekasan, Sumenep
Shallot	Sampang, Bima	Probolinggo, Nganjuk, Pamekasan, Sumenep, Greater Sumbawa
Chili	Malang, Sampang	Batu, Kediri, Pamekasan, Sumenep
Mango	Situbondo, North Lombok	Probolinggo, Kediri, Pasuruan, Greater Sumbawa
Tomato	Malang	Batu, Kediri, Banyuwangi
Potato	Malang	Batu, Pasuruan, Probolinggo, Lumajang, East Lombok
Mung bean	Dompu	Belu

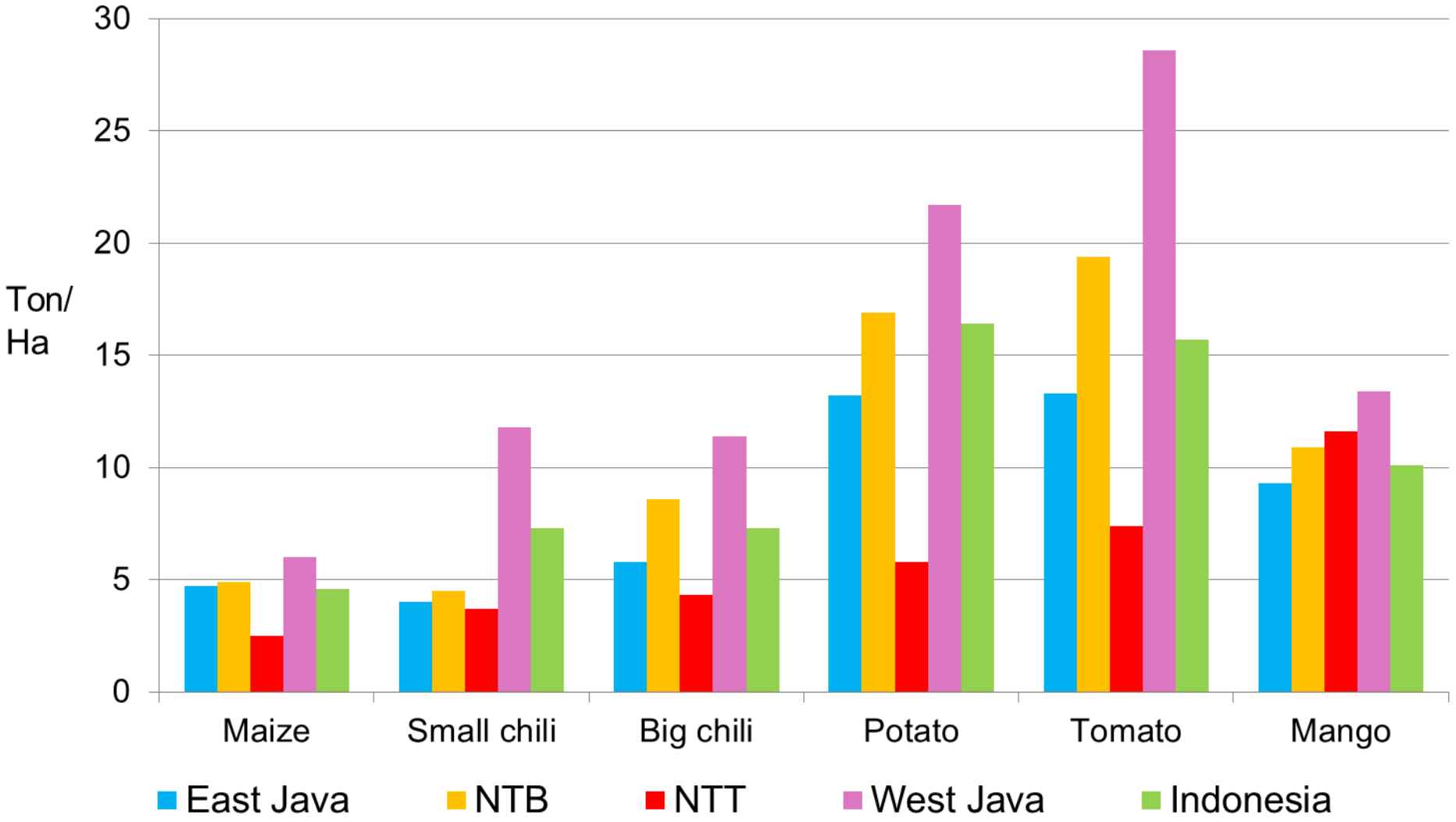
Growth Patterns (2007-12)

There is wide variation in growth performance across sub-sectors



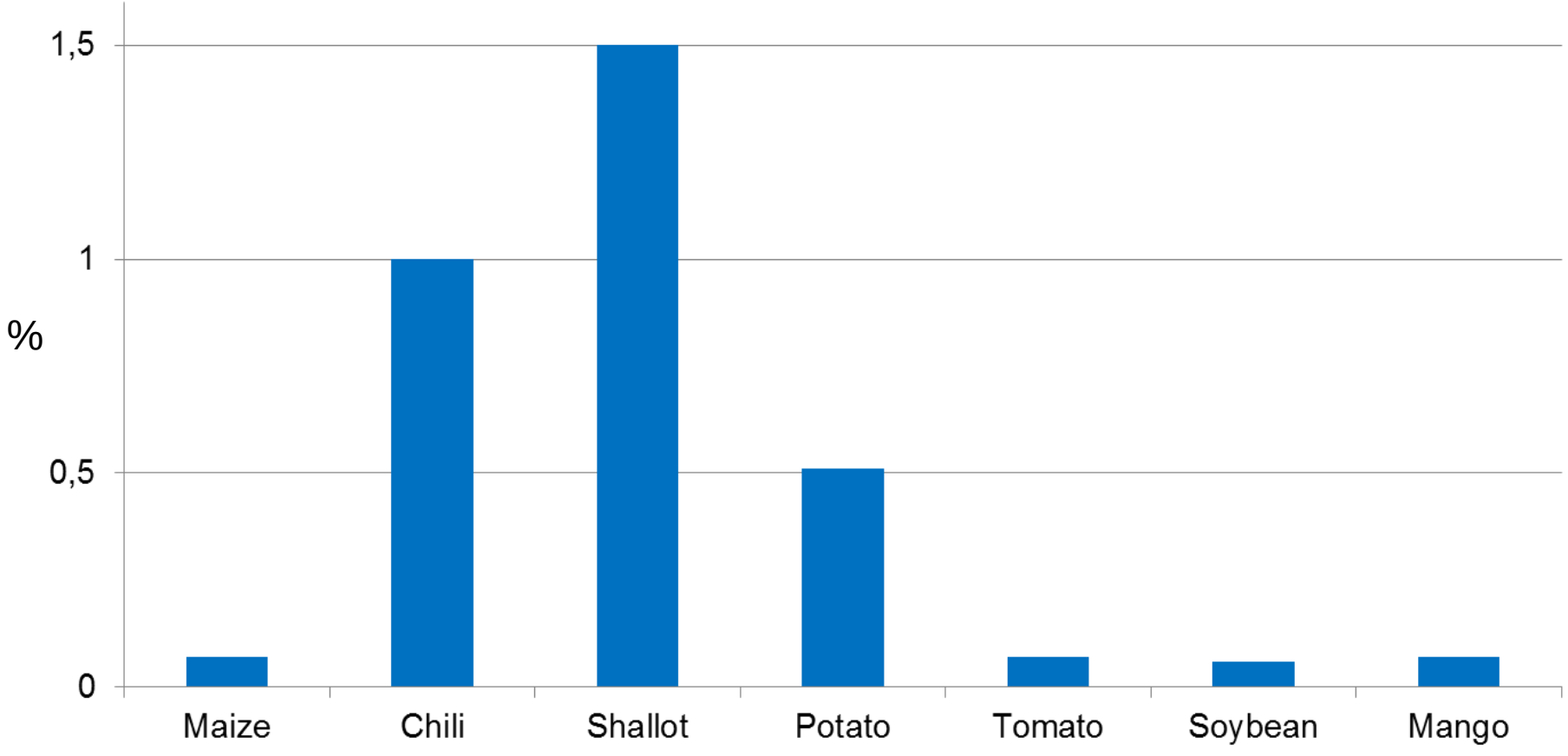
Yield Gaps

For high-value commodities, there is scope for increasing yields

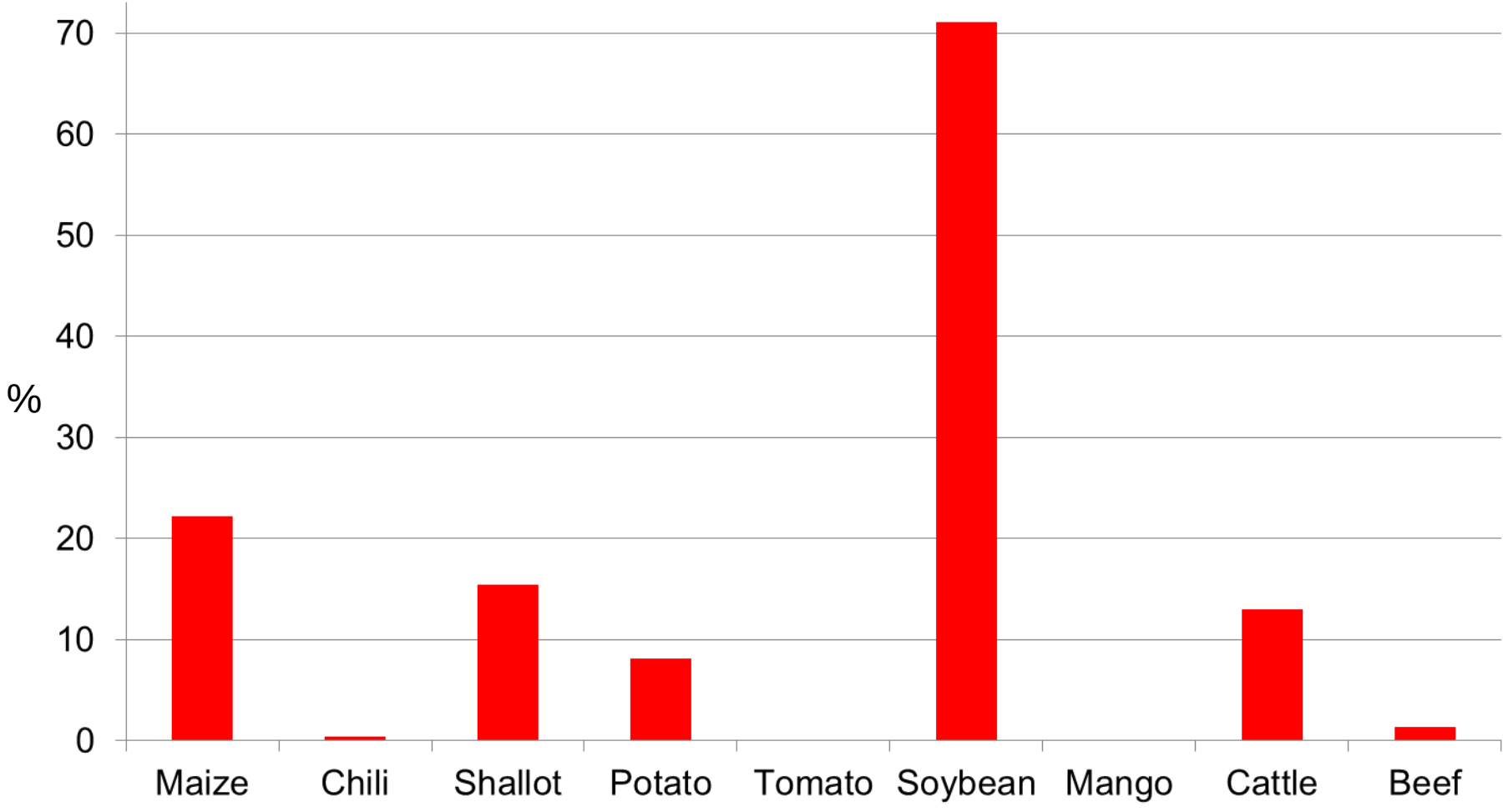


Exports as a Share of Production (2011)

Exports account for a marginal share of domestic production



Imports as a Share of Domestic Supply (2011)



2. Chain Structure

Size of Farms

- Small farms dominate livestock and crop production landscapes

  ⇒ 3-4 cattle heads in East Java
  4-7 cattle heads in NTB and NTT

  ⇒ 0.1-1 ha per crop per household

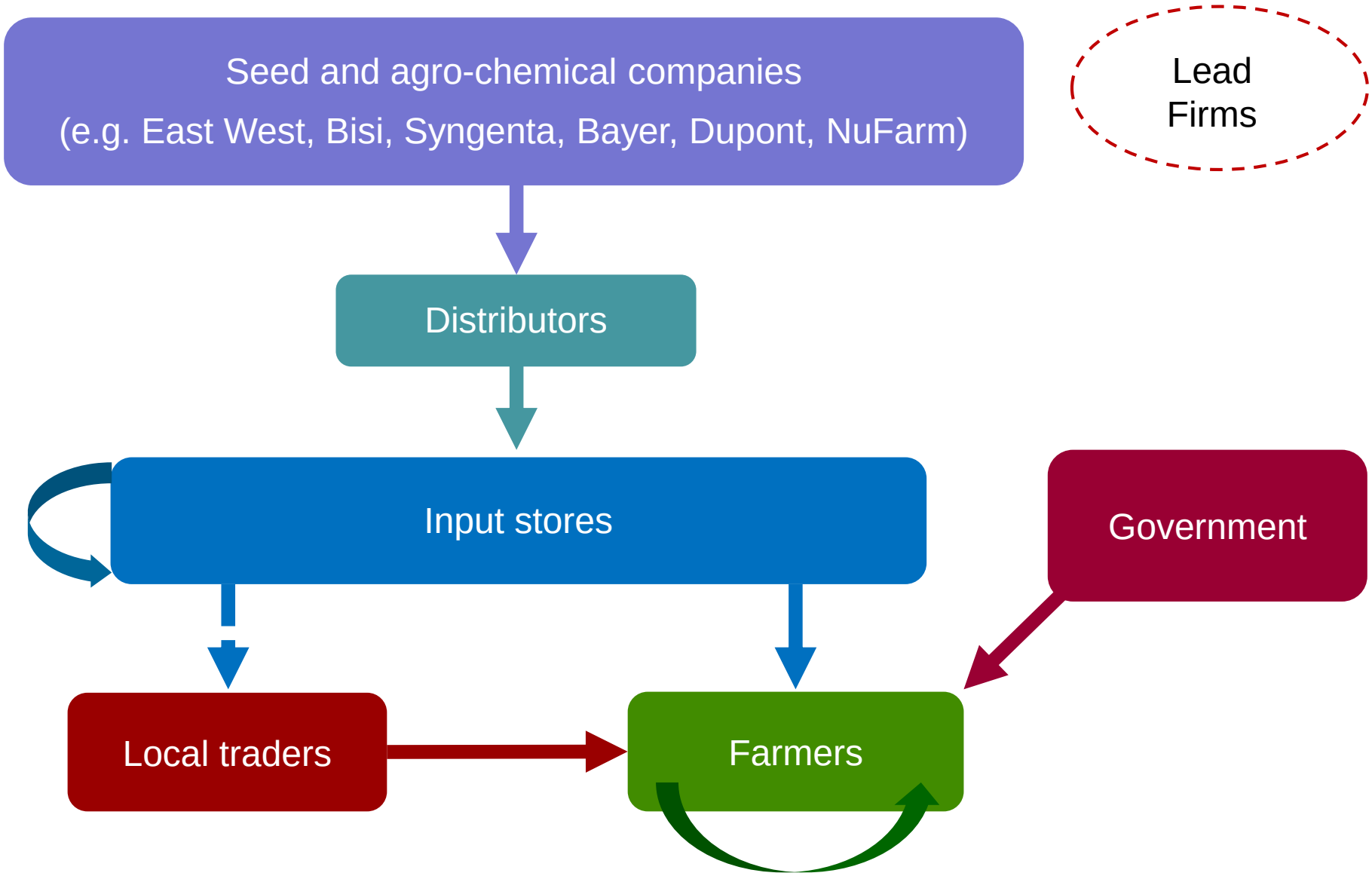
Farmer Groups

- A large number of farmers in Eastern Indonesia are organized in groups

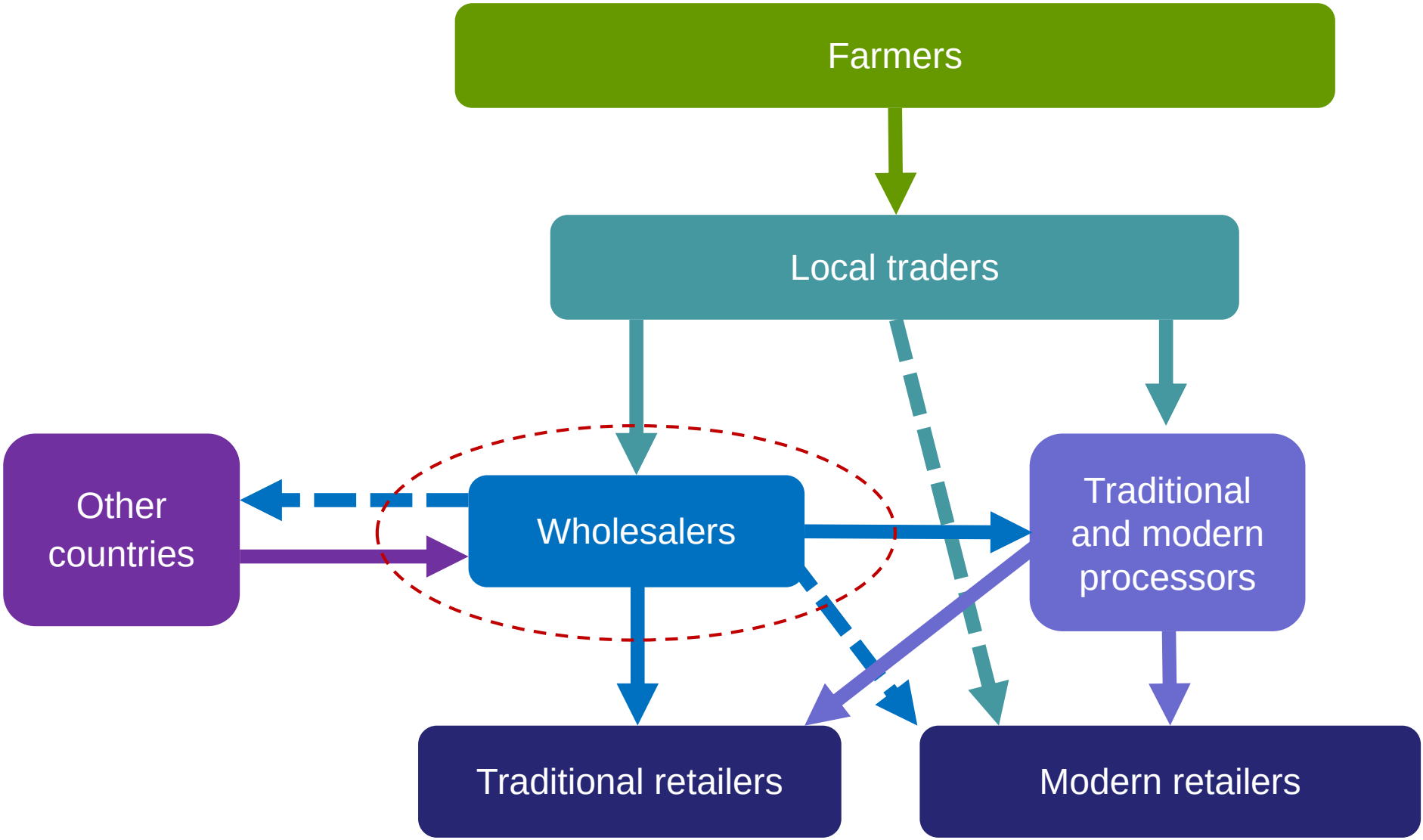
  ⇒ Formed for delivery of extension services, grants, and subsidies

  ⇒ Few operate as production / marketing units ⇔ little impact on chain structures

Input Chain (crops)



Generic (Simplified) Product Chain



Some Observations

- Traditional market channels are dominant
- Farmers rarely have a direct relationship with modern processors, wholesalers or retailers
- In some chains, there are no lead firms (e.g. mango, legumes)
- Export chains are often structured along similar lines as domestic chains

Processing Sector

Sub-sector	Degree of Importance
Maize	*****
Beef	*****
Soybean	****
Chili	***
Peanut	**
Potato	**
Shallot	**
Tomato	*
Mung bean	*
Mango	*

Processing Sector

The structure of the processing sector varies across commodities

Industry	Structure
Animal feed	several large feed mills (8 in Surabaya)
Beef	large numbers of small slaughterhouses and butchers, few medium-sized abbatoirs
Tofu and tempeh	many micro and small household enterprises
Sambal	few and large firms (ABC Heinz, Indofood)
Peanut snacks	few large firms (e.g. Garuda Foods, Dua Kelinci), some household processors (e.g. Malang)
Potato chips	few large firms (Indofood), some household processing clusters (e.g. Batu)
Mango-based products	large juice companies, some micro and small processors

Modern Retail Sector

Supermarket outlets often function as independent fresh food procurement units, leading to very fragmented modern retail structures

Lead chains	Number of outlets
Giant	44 hypermarkets; 96 supermarkets (Sept. 2012)
Hypermart	90 hypermarkets
Carrefour	60 hypermarkets; 20 supermarkets (2009)
Ramayana	121 supermarkets
Hero	36 supermarkets (Sept. 2012)

Modern Retail Segment

Supermarkets have a small, often marginal share of the retail market

Share of the retail market	
Imported fruit	significant
Local fruit	small
Beef	small to marginal
Fresh vegetables	marginal
Processed foods	significant

Modern Retail Segment

Percent of households in Bogor, Solo and Surabaya that purchase mainly from hypermarkets and supermarkets

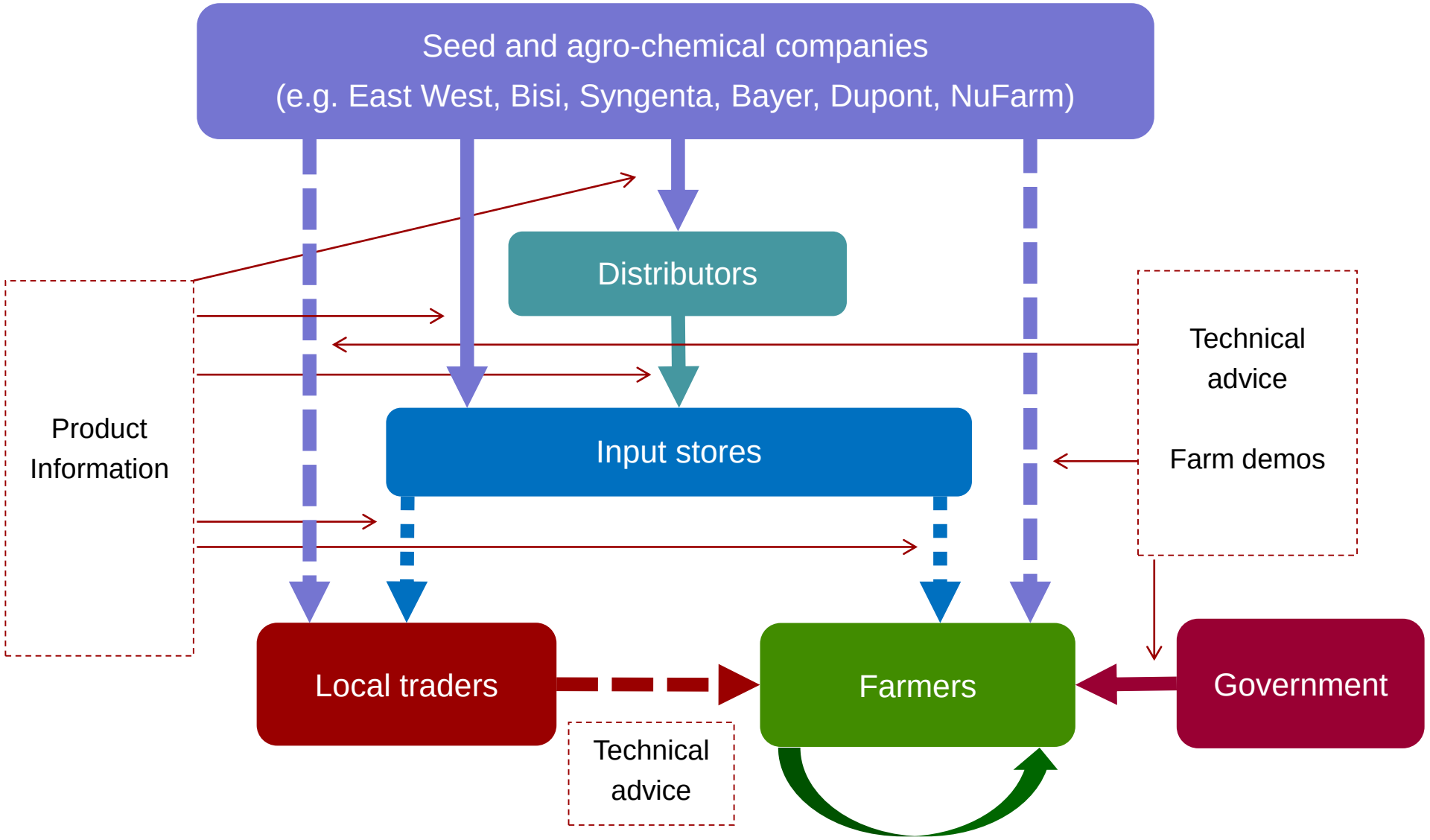
Lead chains	%
Mango	8.9
Tomato	2.3
Potato	2.2
Shallot	1.4
Chili	1

Implications: Modern Retail Segment

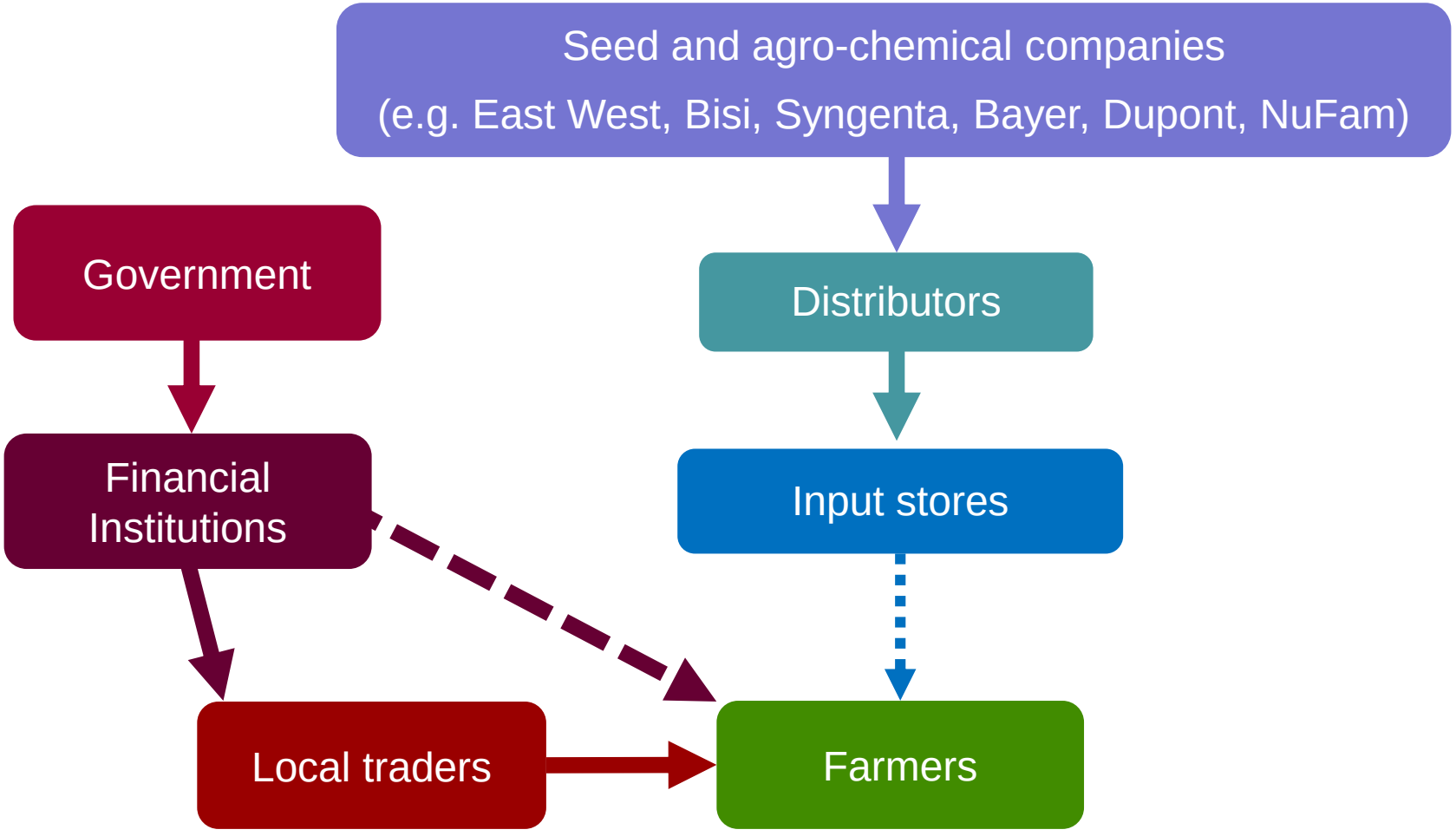
- Past studies have highlighted the opportunity for integrating smallholder farmers in modern retail chains
- This recommendation is somewhat flawed:
  - ⇒ Exaggerated claims about the size of the supermarket segment
  - ⇒ Analysis focuses on prices and margins, but neglects volumes (and the conduct of supermarket chains!)

3. Chain Conduct

Input Chain: Knowledge Flows



Input Chain: Credit Flows



Strategic Implications

- Input retailers are very passive chain actors
- Input companies provide possible entry points for technical change at the farm level through their field agent networks

Maize Seed Distribution by Government

- Government distribution of free or subsidized maize seed has been criticised:
  - ⇒ late delivery
  - ⇒ poor seed quality
  - ⇒ wrong variety
  - ⇒ crowding-out of the private sector

Horizontal Coordination: Collective Action

- Very few farmer groups operate as collective marketing enterprises
  - ⇒ formed as vehicles for delivery of extension services, free or subsidized inputs, and subsidized credit
  - ⇒ dominance of traditional market channels characterized by strong competition
  - ⇒ poor development of premium quality chains
  - ⇒ lack of innovative lead firms working closely with farmers

Vertical Coordination: Spot Market Transactions

- Spot market transactions account for the majority of trade in the chains surveyed
- Prompt payment is the norm

Vertical Coordination: Spot Market Transactions

- Farm-gate prices are often a function of quality attributes
- But poor price differentiation or incentives in some chains (e.g. soybeans, maize, farmers selling mango fruit on the tree)
- Farmers are constrained in their ability to take advantage of quality-upgrading opportunities (e.g. technical knowledge, investment and risk-taking capacity)

Vertical Coordination: Spot Market Transactions

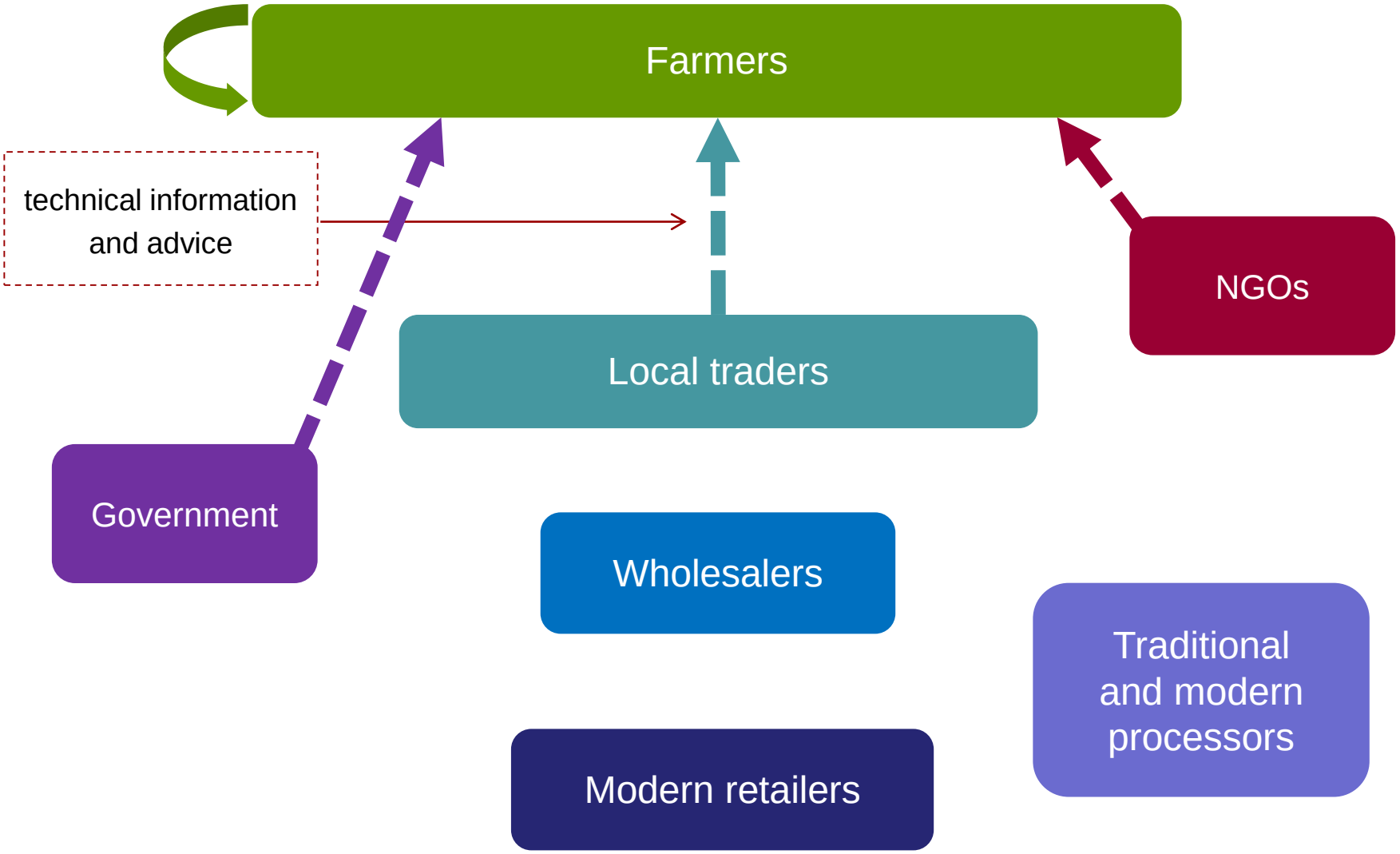
- Trust is a critical determinant of choice of suppliers and buyers

  ⇒ Transaction costs

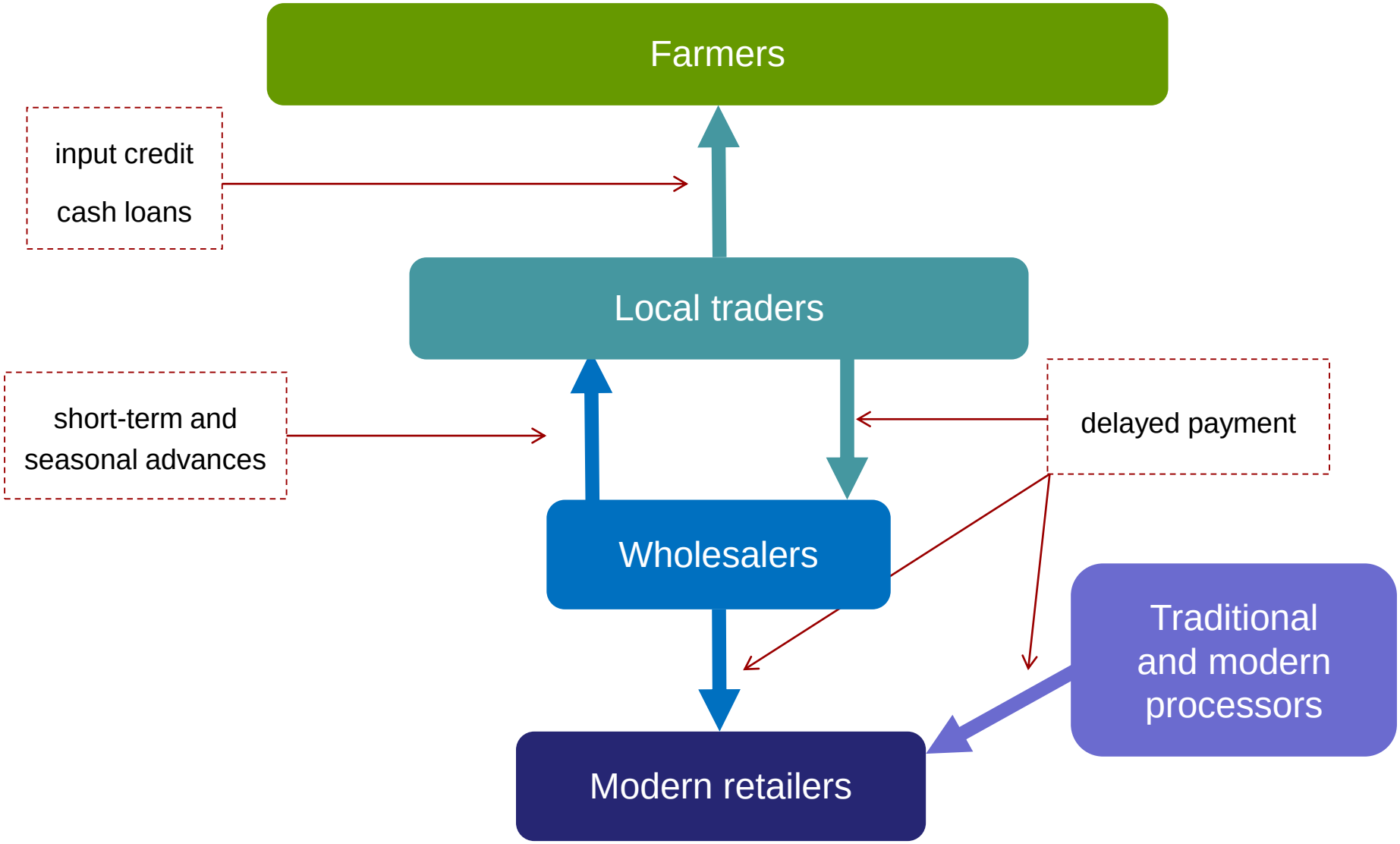
  ⇒ Risk

- Long-standing business relations along the chain are common

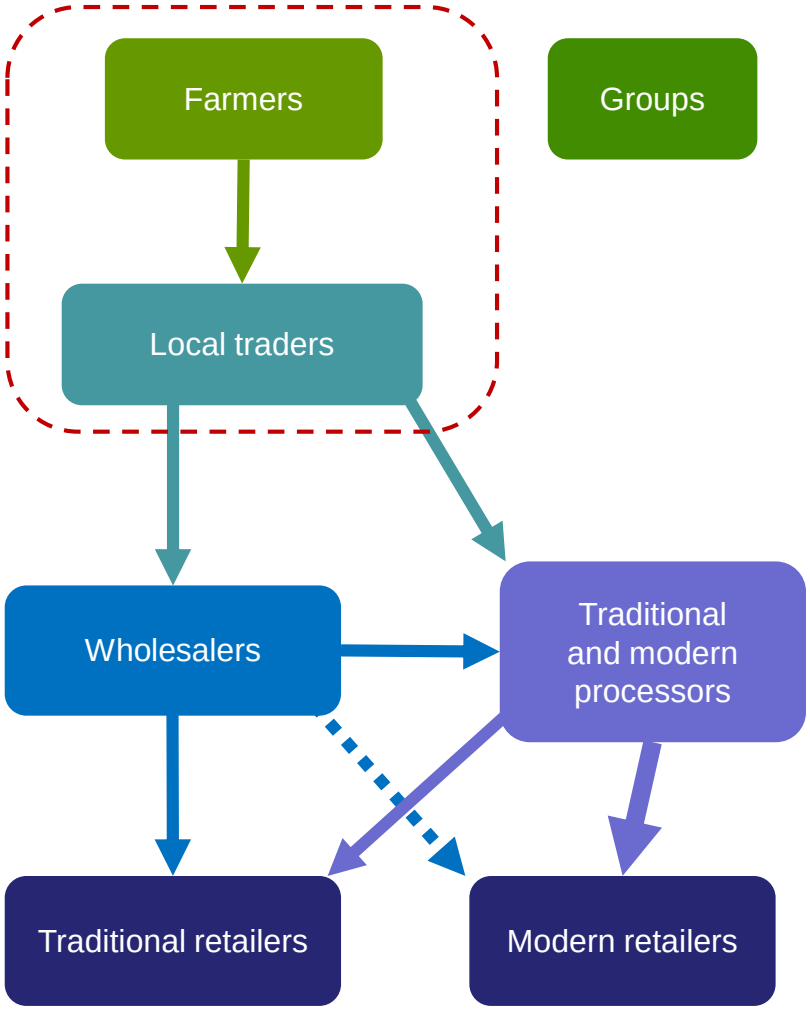
Flows of Technical Knowledge



Main Credit Flows

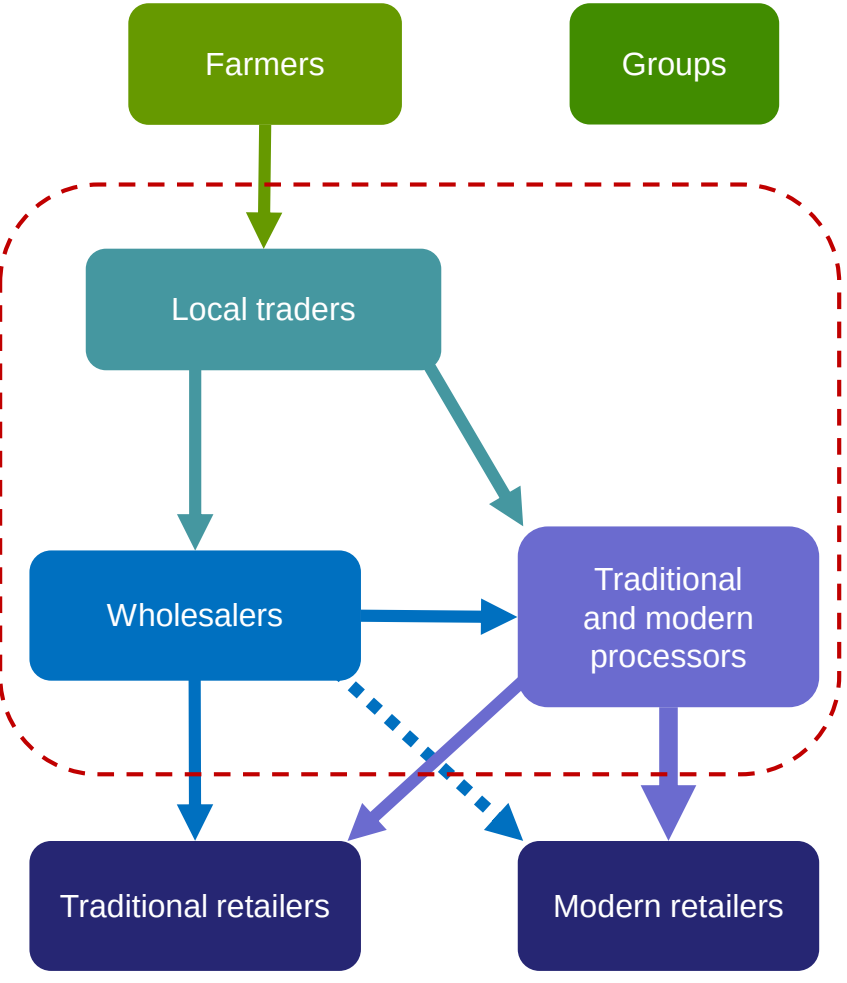


Strategic Implications: Targeting



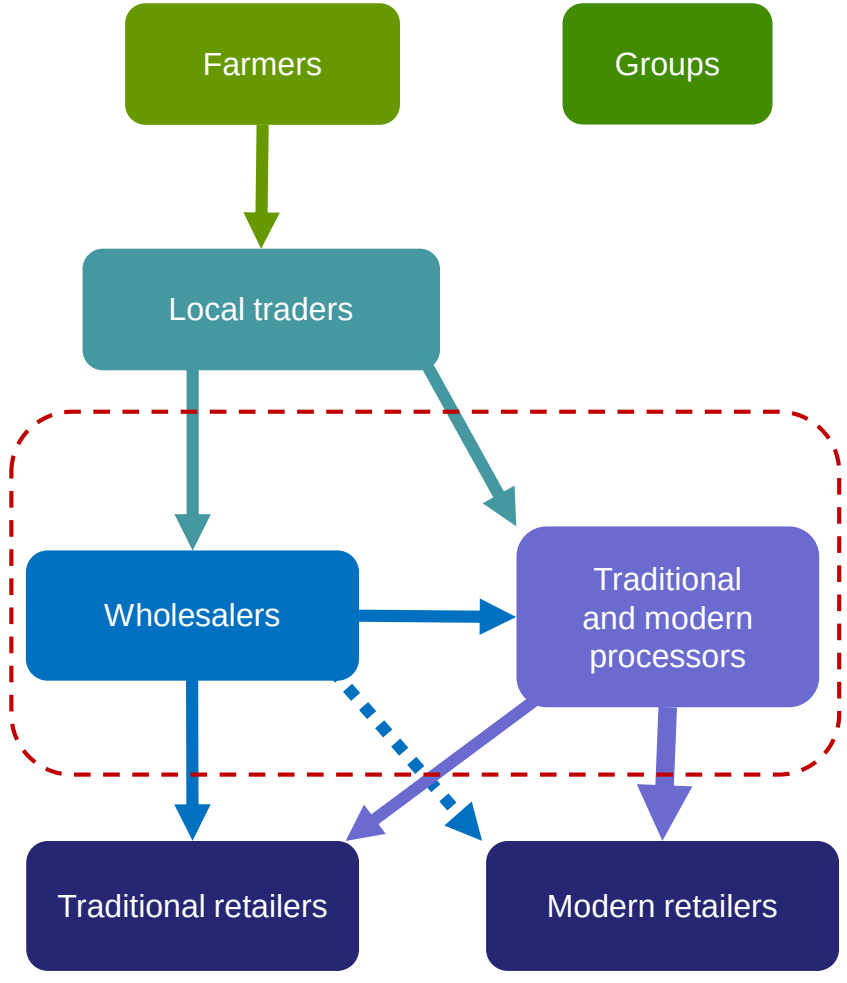
- Credit functions as an implicit verbal contract whereby the farmer agrees to sell to the lending trader or processor
- Exchange of technical information is often embedded in these transactions, but limited by knowledge constraints
- Local traders and processors may provide an effective entry point for injection of technical and market know-how

Strategic Implications: Targeting



- Existing farmer groups may provide an effective entry point for an upgrading of production systems, but few are likely to evolve into successful formal or informal cooperative enterprises
- Larger, more entrepreneurial local traders with close links to smallholders often provide a more cost-effective and sustainable entry point for an upgrading of market linkages
- Are cattle groups a special case?

Strategic Implications: Market Linkage Facilitation



- The importance of trust has significant implications for value chain development programmes ⇔ market linkage facilitation services

Vertical Coordination: Contract Farming

- Contract farming is uncommon in the chains surveyed
  - ⇒ risk of side-selling / strategic default (well-developed spot market channels)
  - ⇒ Poorly-developed premium chains (domestic and export markets)
  - ⇒ imports offer a cheaper alternative (e.g. maize, Atlantic potato)
- Contract farming is common in the seed, poultry, and tobacco chains

Examples of Contract Farming Schemes

Most contract farming schemes in the study chains have limited outreach; significant differences in their performance

Contracting firm	Contract crop	Location	No. contract growers
Unilever	Black soybean	8 districts (6 in EJ, incl. Trenggalek)	9,000
Indofood	Atlantic potato	Bondowoso (EJ), Sembalun (NTB)	~ 500
ABC Heinz	Big red chili	several districts of EJ	30-80 per district
Garuda Foods	Peanut	NTB (defunct)	Unkown
Horti Bima	Peas	Malang	~ 150

Strategic Implications: Contract Farming

- A flexible, opportunistic approach is needed for impacts at some scale

  ⇒ Choice of commodities

  ⇒ Choice of target areas (incl. non-AIPD districts)

  ⇒ Work with several agribusiness firms

- Interventions should be preceded by careful assessment of potential benefits to both parties in the contract

Strategic Implications: Contract Farming

- Possible intervention strategies
  - ⇒ Assist contracting firms to improve existing schemes (are under-performing but have the potential to deliver benefits to farmers and the contracting party)
  - ⇒ Support firms that would like to expand successful contract farming operations, but cannot afford the full costs and risks
  - ⇒ Support establishment of new schemes

Vertical Coordination: Processing Industry

Spot market purchases from traders are dominant

Industry	Procurement Strategies
Animal feed	Buy maize from large traders based on spot market conditions; rely on imports to meet local supply gaps; price discounts for moisture
Cattle meat	Abbatoirs provide slaughter facilities for a fee: do not take ownership of animals or meat
Tofu and tempeh	Buy in spot markets from local traders and farmers
Sambal	Buy chilli in spot markets from large traders; have some forward contracts for big red chili with farmer cooperatives and traders in production areas

Vertical Coordination: Processing Industry

Spot market purchases from traders are dominant

Industry	Procurement Strategies
Peanut snacks	Buy in spot markets from large traders; rely on imports to meet local supply gaps; have some contract farming schemes (e.g. Garuda in Sulawesi)
Instant noodles	Purchase low-quality shallots for noodle sauces from traders in spot markets
Roasted shallots	Household processors purchase low-quality shallots from traders in spot markets
Potato chips	Relies on imports; has some direct sourcing arrangements with contract growers, mainly in West Java In Batu, household processors purchase Granola variety in spot markets from farmers and local traders

Vertical Coordination: Modern Retail Segment

- Supermarkets are passive chain actors
- Heterogeneous in their procurement strategies
  - ⇒ Quality standards
  - ⇒ Systems (outlet-based *vs* DC*)*
- High prices, small volumes
- High sanctions for non-compliance with contractual conditions
- Very late payment (1-2 months)

4. Chain Performance

Export Competitiveness

Exports account for a marginal share of production

	Low	Medium	High
Maize			
Chilli			
Shallot			
Potato			
Tomato			
Soybean			
Peanut			
Mung bean			
Mango			
Beef cattle			

Export Competitiveness

- Strong involvement of modern firms with close links to farmers (e.g. Horti Bima) is necessary for successful export development in the vegetable sub-sector

- Significant export opportunities were identified for mango, but innovation at farm level and in post-harvest management systems (especially at the export end) is required for significant export growth

Import Competitiveness

Imports of some EI-ADO commodities are high, despite restrictive government measures, such as licences and quotas

	Low	Medium	High
Maize			
Chili	Processed		Fresh
Shallot	Off-season		In season
Potato			
Tomato	Processed		Fresh
Soybean			
Mango	Processed		Fresh
Beef	Cattle		

Farm Productivity (Ton/Ha) Growth, 2007–2012

In recent years, productivity growth has been high or very high for 6 EI-ADO commodities

	Low 0 – 2% p.a.	Medium 2% – 4% p.a.	High > 4% p.a.
Maize			
Chili			
Shallot			
Potato			
Tomato			
Soybean			
Peanut			
Mung bean			
Mango			
Beef cattle			

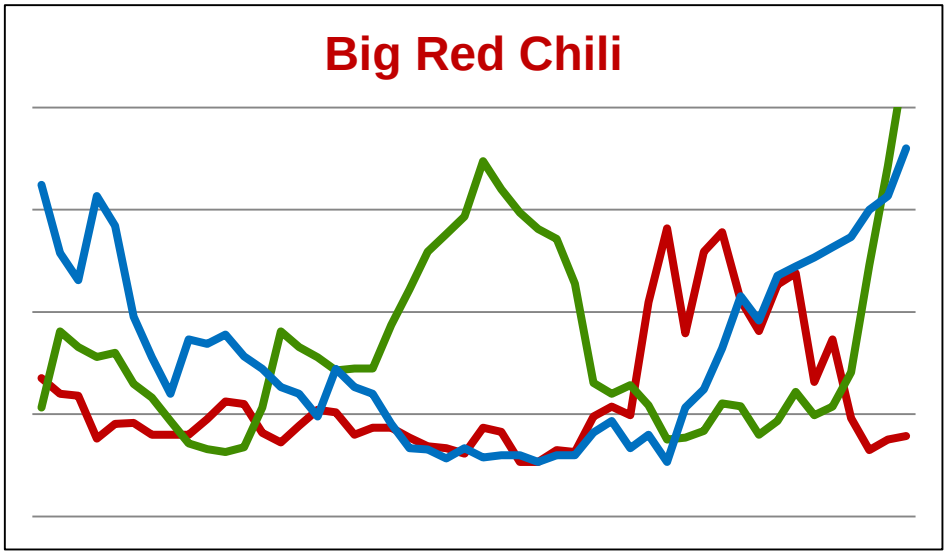
High Post-Harvest Losses

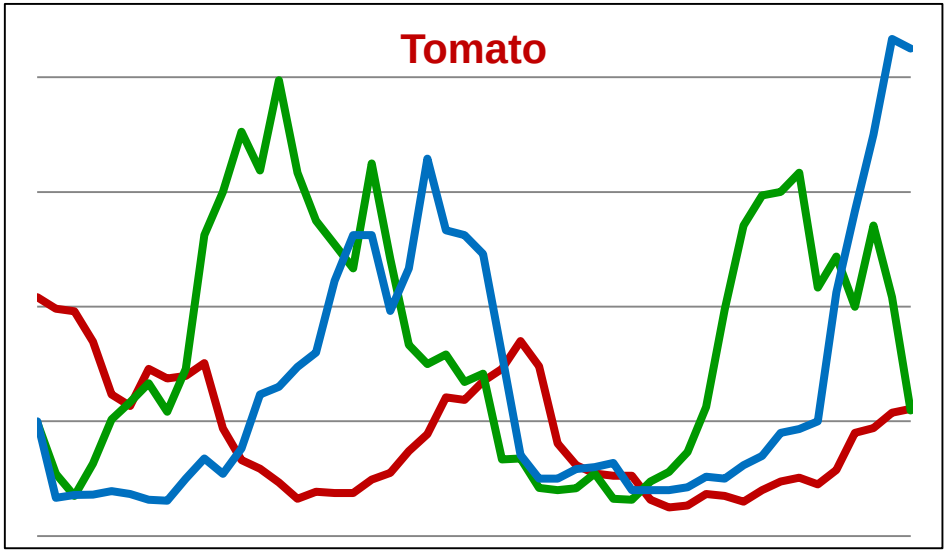
- Storage of maize for human consumption (NTT)
- Storage of shallot bulbs for propagation and consumption
- Tomato shipped from Batu to Kalimantan during the rainy season
- Mango shipped from East Java to Sumatra via West Java (?)
- Cattle in the long-distance inter-island trade (e.g. from NTT to EJ)

Market integration

- Some studies show strong levels of market integration (efficiency) in Java
- Trade between East Java and NTB is well developed
- Long-distance inter-island trade from and within eastern Indonesia is constrained by high transportation costs, product losses, and trade policies

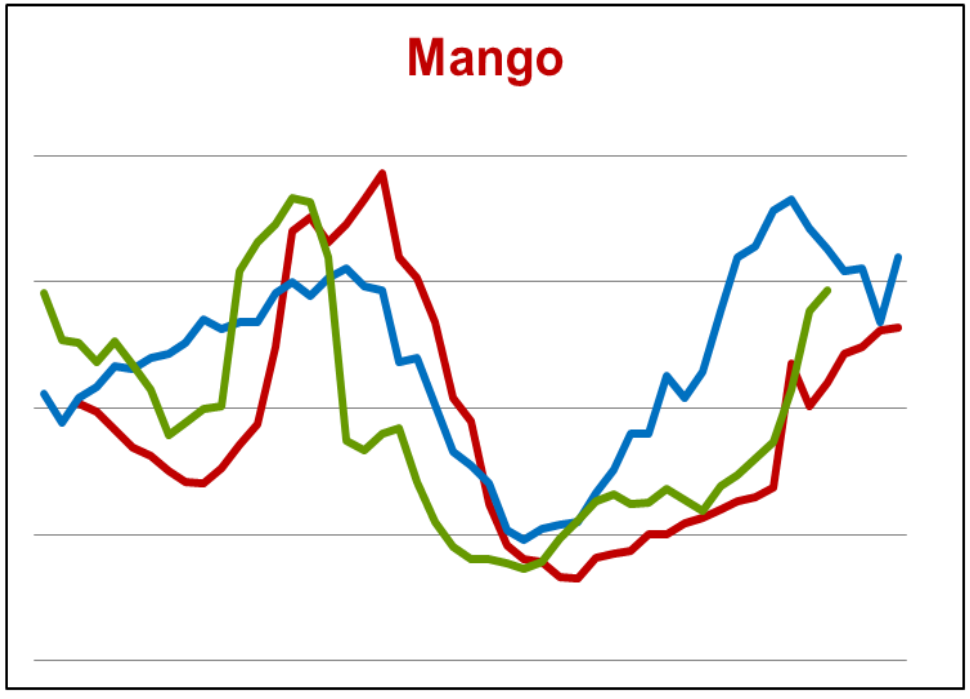
Short-Term and Inter-monthly Price Volatility





- Weather
- Product perishability
- No cold storage

Seasonal Price Variations



- Mango:
  - ⇒ Very incipient development of exports and processing
  - ⇒ Limited adoption of crop manipulation technologies for off-season cultivation
- For some other crops: import restrictions and limited storage (e.g. shallot, maize in NTT) contribute to inter-seasonal price variations

5. Opportunities for Pro-Poor Impacts

Participation of the Poor

Some EI-ADO crops are not suited to the very poor due to high investment costs (and production and marketing risks), but wage employment impacts need to be considered as well

	Farm Production cost (excl. household labour) IDR '000 / Ha	Wage employment No. Person days / Há
Chili (Malang)	25 – 45,000	290
Tomato (Malang)	40,000	320
Maize (TTU, Kupang, Bima)	1,700 – 6,000	55 – 90 (*)
Soybean (Trenggalek, Sampang, Dompu)	7,800	150
Peanut (Malang)	8,600	64
Mung bean (upland Belu)	1,800	35

Participation of Women

	Participation of women in farm production
Cattle	***
Maize	***
Soybean	***
Peanut	***
Shallot	***
Chili	***
Mango	*
Tomato	***
Potato	***
Mung bean	***

- Women are heavily involved in the production of EI-ADO commodities (except for mango), but farms are usually managed by men
- Participation of women in producer groups is low
- There is a clear gender gap in farm wages
- Farm sales are generally conducted by men, but women often have a say in income allocation

Participation of Women

- Participation rates for women at different stages in the chain vary across commodities, but they have a strong presence in the retail trade
- Women generally account for most of the labour force in processing enterprises (tofu and beef slaughtering are exceptions)

Environment and Human Health (Crops)

Negative	Positive
•Misuse and overuse of pesticides •Aflotoxins in maize and peanuts •Deforestation and use of overgrazed land for maize cultivation (NTB) •Encroaching of potato cultivation into Mount Bromo National Park •Waste from traditional processing activities (e.g. tofu) •Workers' health in some traditional processing activities (e.g. tofu)	•Legumes ⇔ soil fertility

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Environment (Cattle)

Negative	Positive
•Methane emissions •Depletion of natural resources •Effluent run-off	•Use of straw as feed •Manure ⇔ soil fertility •Legume forages ⇔ soil fertility

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Pathways for Increasing Smallholder Incomes

According to the chain studies, increases in farm productivity offer the main opportunities for income impacts

	Productivity	Price
Maize		
Vegetables		
Legumes		
Mango		
Cattle		

Pathways for Increasing Smallholder Incomes

	Productivity	Price
Maize	variety, farm management	
Vegetables	variety, seed quality, farm management	variety, market info / farm planning, inter-island trade, reduction in post-harvest losses, storage, contract farming
Legumes	seed quality, farm management	
Mango	off-season cultivation, farm management	off-season cultivation, quality, development of export and other high-value chains
Cattle	AI, feed, animal management	chain linkages

Gender Impacts of Proposed Interventions

	Impacts on women
Cattle	• Forages reduce the time women spend collecting feed
Maize	• Neutral
Vegetables	• Development of grafting seedling production and potato processing generate employment for women. .
Legumes	• Development of small processing enterprises generates employment opportunities for women.
Mango	• Women have very little involvement in mango production and the early marketing stages. • The development of quality (including export) chains would generate employment opportunities for women in post-harvest activities.

Environmental Impacts of Proposed Interventions

	Impacts on the environment (and human health)
Cattle	• Improved feed technologies reduce land degradation due to grazing
Maize	• A shift from OPVs to hybrids leads to increased use of agro-chemicals • Improved drying technologies and practices reduces aflotoxin
Vegetables	• Improvements in pest management practices can lead to a reduction in agro-chemical use
Legumes	• Increased legume production has beneficial impacts on soil fertility
Mango	• Off-season cultivation and commercialization of mango farms leads to increased use of agro-chemicals. • Fruit bagging technologies significantly reduce the need for agro-chemicals

Proposed Entry Points for Innovation

The chain actors identified as potential agents of innovation reflect chain structures and to a lesser extent chain conduct

	Input companies	Input retailers	Seed farms	Traditional traders	Traditional processors	Modern processors
Maize	✓	✓		✓		✓
Vegetables	✓		✓	✓	✓	✓
Legumes			✓	✓	✓	✓
Mango	✓			✓		

	Govt. Progr.	Input providers	Local service providers	Feedlots	Traditional traders	Butchers
Cattle	✓	✓	✓	✓	✓	✓

Input Companies

Strengths	Potential weaknesses / risks
•can impact on large numbers of farmers •financial capacity •network of field agents	•individual seed and agro-chemical companies may only offer partial (and not always the best) solutions •may be reluctant to engage in technology and knowledge transfer processes for fear that competitors will benefit •may lack critical, crop-specific know-how

Input Retailers

Strengths	Potential weaknesses / risks
• service many farmers	• have very poor knowledge of specific crops and farm technologies • have shown little interest to engage in knowledge transfer processes (as an embedded service) • can they can add value to farmers' knowledge, especially for complex technical innovations?

Traditional Traders and Processors

Strengths	Potential weaknesses / risks
•have or can develop close and effective links to farmers •often have the incentives to provide finance and transfer technology and technical know-how to farmers	•limited financial capacity •limited outreach •in some contexts, may be reluctant to engage in technology and knowledge transfer processes for fear that competitors will benefit and because of a lack of opportunities to target higher-value markets •tend to operate in lower-value traditional chains

Modern Processors

Strengths	Potential weaknesses / risks
•financial capacity	•limited outreach •often prefer to buy in spot markets than develop foward contract arrangements with farmers and traders in production areas •the design and implementation of contract farming shcemes is often inadequate

Outreach

- With the exception of input companies, individual chain actors offer limited scope for systemic, leveraged impacts

⇒ **Implication:** AIPD-Rural will need to engage with many chain actors in order to achieve critical mass

Who Supports Chain Actors to Become Agents of Change?

- In many cases, chain actors lack the required technical know-how and chain linkages to drive target innovations

⇒ **Implication:** AIPD will sometimes need to inject critical know-how into the system (for example by working with technical experts)

Incentives for Innovation

- In some cases, chain actors will lack clear incentives to drive local innovation: e.g. benefits cannot be internalized in a context characterized by strong competition in spot markets

6. Lessons and Implications for Pro-poor Development

Government

- Need to rethink the balance across commodities in government priorities
- Need to rethink the balance between import protection and subsidies, on the one hand, and investment in infrastructure and research and extension
- Policy is often erratic and poorly implemented
- Agricultural extension is having a limited impact on farm-level innovation and productivity

Government

- Government policy can have significant negative impacts on the performance of marketing systems:
  - ⇒ Domestic trade policies: spatial arbitrage
  - ⇒ International trade policies and regulations: quality and cost of seed, transaction costs, transportation costs, spatial arbitrage, exports, consumer welfare
  - ⇒ Subsidized seed programmes: private sector development
- Strong need for evidence-based policies

Private Sector

- Large agribusiness firms often have a poor understanding of contract farming design and implementation
- Private sector often lacks critical technical know-how for supporting farm-level innovation

Development Programmes

- Area-based approaches (district-focused) limit the opportunities for pro-poor chain upgrading innovations and impacts
- A commodity / chain focus is appropriate, but could be complemented by more agribusiness-centred approaches

  ⇒ Identify agribusiness-led innovation opportunities

  ⇒ Work with and support selected agribusiness firms when there is a strong pro-poor rationale

Development Programmes

- Lead firm innovation models are challenging in contexts dominated by well developed spot markets, highly fragmented market landscapes, and/or poorly developed premium chains
- How to work with large government programmes? (case of cattle)

Research: Some Strategic Priorities

Government policy and programmes have significant impacts on the performance of production and marketing systems; there is an urgent need for evidence-based policy

Policy

- Assessment of variety development programmes (e.g. mango)
- Impact of seed and international trade policies on the performance of seed supply systems (e.g. potato and shallot)
- Performance and impacts of government programmes in the maize and cattle sub-sectors
- Impact of domestic cattle trade policies on farmer incomes, sustainability of local herds, and the performance of marketing systems
- Impact of international trade policies and regulations on production, the performance of marketing systems, and consumer welfare

Research: Some Strategic Priorities

There are systemic and localized knowledge failures regarding farm technologies and management systems for improved farm productivity and incomes (and technology commercialization strategies and models)

Production	•Varieties: agronomic performance and financial returns (e.g. Gedong Ginku mango in EJ, processing and table potato in EJ, shallot varieties in Madura) •Seed supply systems and business models for OPVs and vegetatively propagated crops (e.g. legumes, potato, shallot) •Action-research on other, locally-appropriate technologies for raising productivity (e.g. forages, grafted tomato seedlings, pest and disease management) •Factors hindering technology adoption (e.g. hybrid maize in Madura, nurseries) and implications for programme interventions •Technology commercialization models (e.g. grafted tomato seedlings) •Farm-gate price incentives for investment in quality

Research: Some Strategic Priorities

There is a need for much greater understanding of post-harvest technologies with potential to reduce losses, enhance the profitability of storage and long-distance transportation, and enable export development

Post-harvest	•Technical and financial feasibility of different storage technologies and methods (e.g. shallot, cold storage for tomato and chilli, legume seed) •Profitability of inter-seasonal storage (e.g. shallot, maize in NTT) •Action-research to determine physical and quality losses (and associated costs and risks) in long-distance trade (e.g. tomato and mango) •Action-research to test the technical and financial feasibility of different post-harvest technologies and management options in long distance and export trade (e.g. mango, vegetables)

Research: Some Strategic Priorities

Processing for the industry and exports are very under-developed in Indonesia; research can contribute to the development of the processing industry and plays a particularly important role in export development

Processing	•Financial feasibility of processing for the industry (e.g. mango and tomato) •Technologies with potential to increase the profitability of traditional processing sectors (e.g. tofu, tempeh, potato chips) •Business models
Exports	•Export market opportunities and requirements •Consumer demand and preferences in potential markets •Varieties for export •Market access protocols (e.g. mango) •Business models •Post-harvest and cold chain management, sea freight transportation

Research: Some Strategic Priorities

Contract farming is under-developed in eastern Indonesia, but offers opportunities for improving farmers' access to credit, technology, advisory services, and markets

Contract Farming	•Performance of existing contract farming systems in Indonesia and opportunities for improvement •Opportunities for development of contract farming in eastern indonesia