Strategic Assessment of Agricultural Value Chains in Eastern Indonesia: Lessons and Implications for Pro-Poor Development

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Australian Government
Australian Centre for International Agricultural Research

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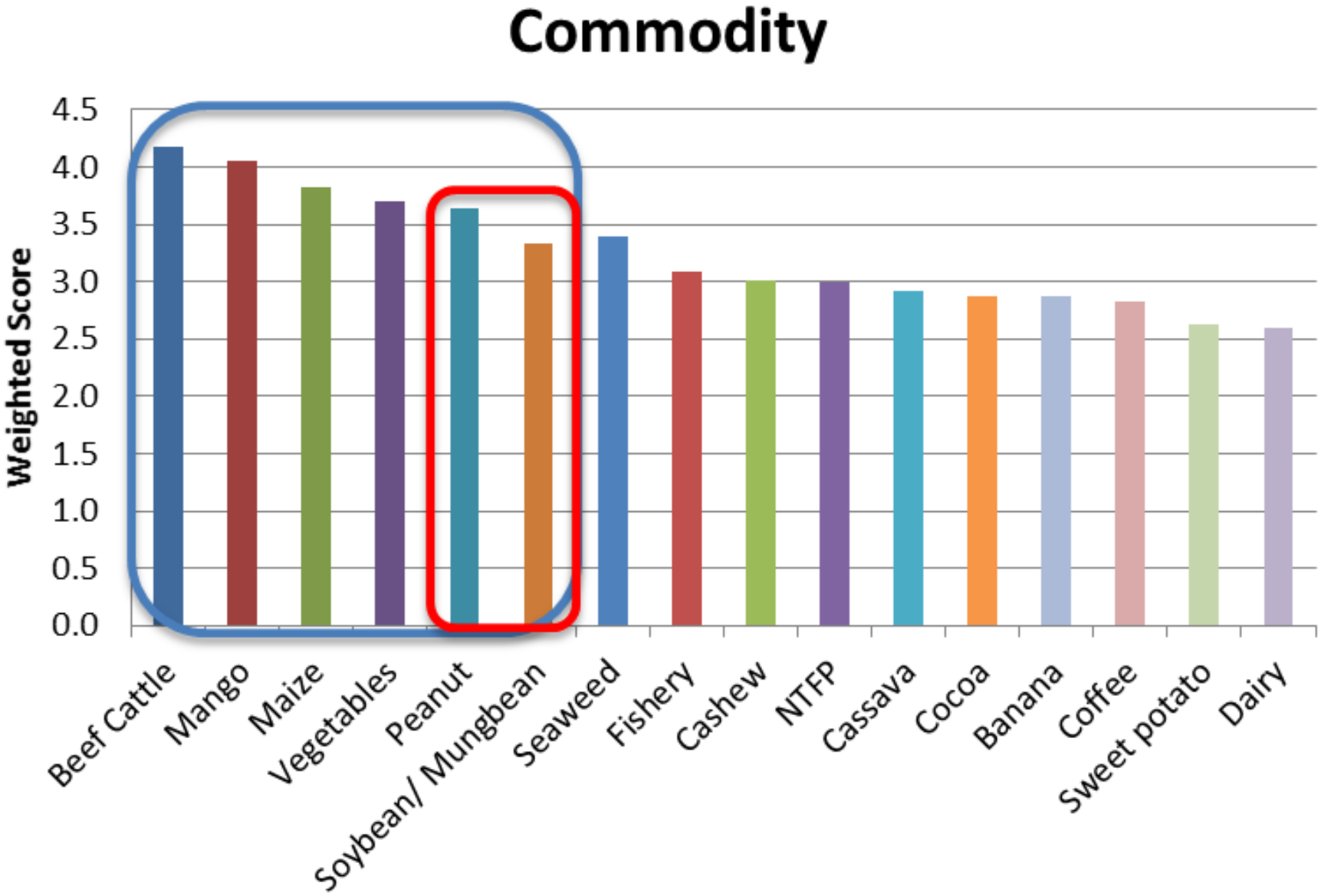
Structure of Presentation

1. Introduction
2. Sub-Sector performance
3. Spatial patterns
4. Chain structure
5. Chain conduct
6. Chain performance
7. Cross-cutting issues
8. Opportunities for pro-poor chain innovation
9. Lessons / implications for pro-poor development

1. Introduction

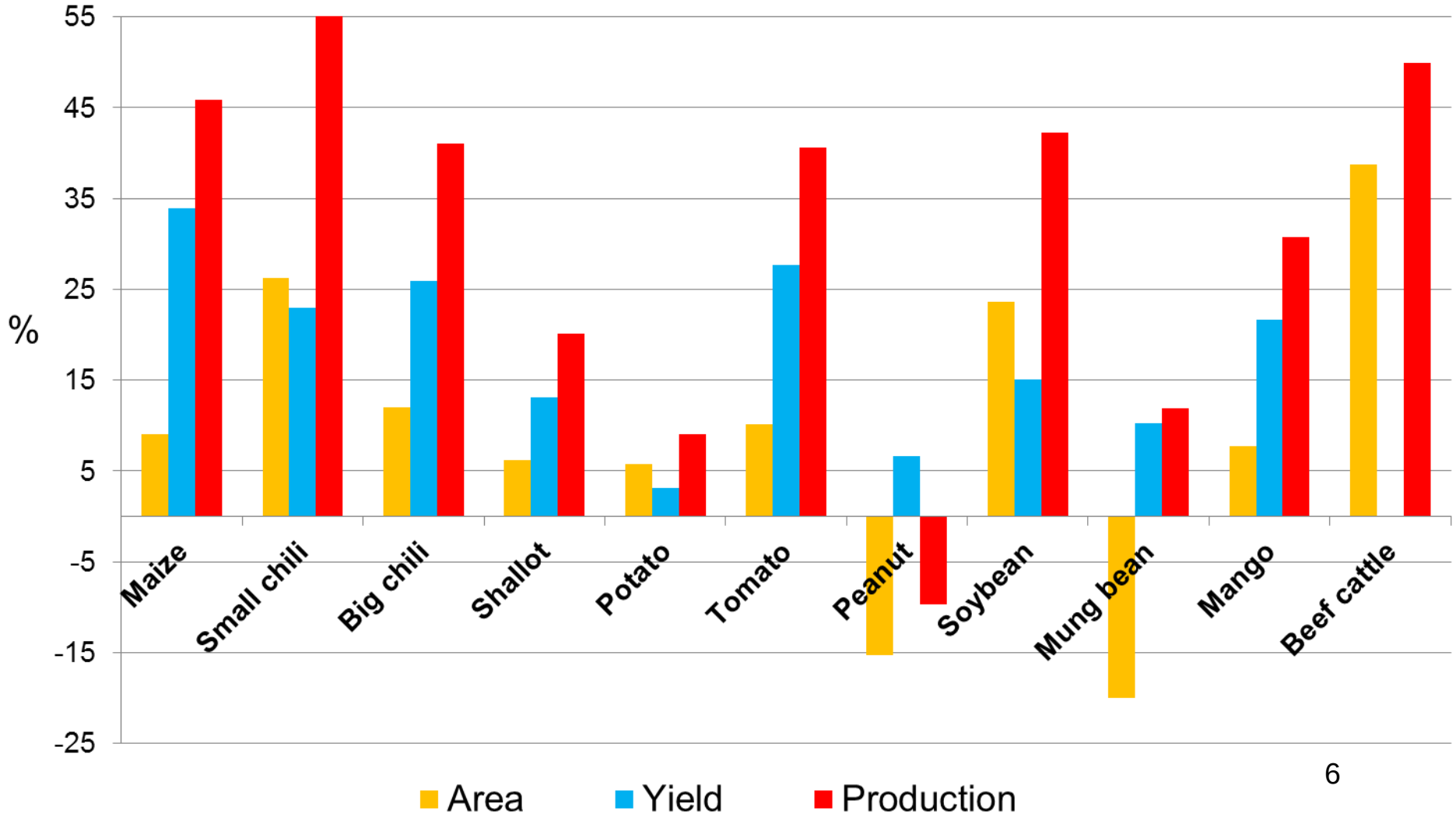
Chain Selection Process



2. Sub-Sector Performance

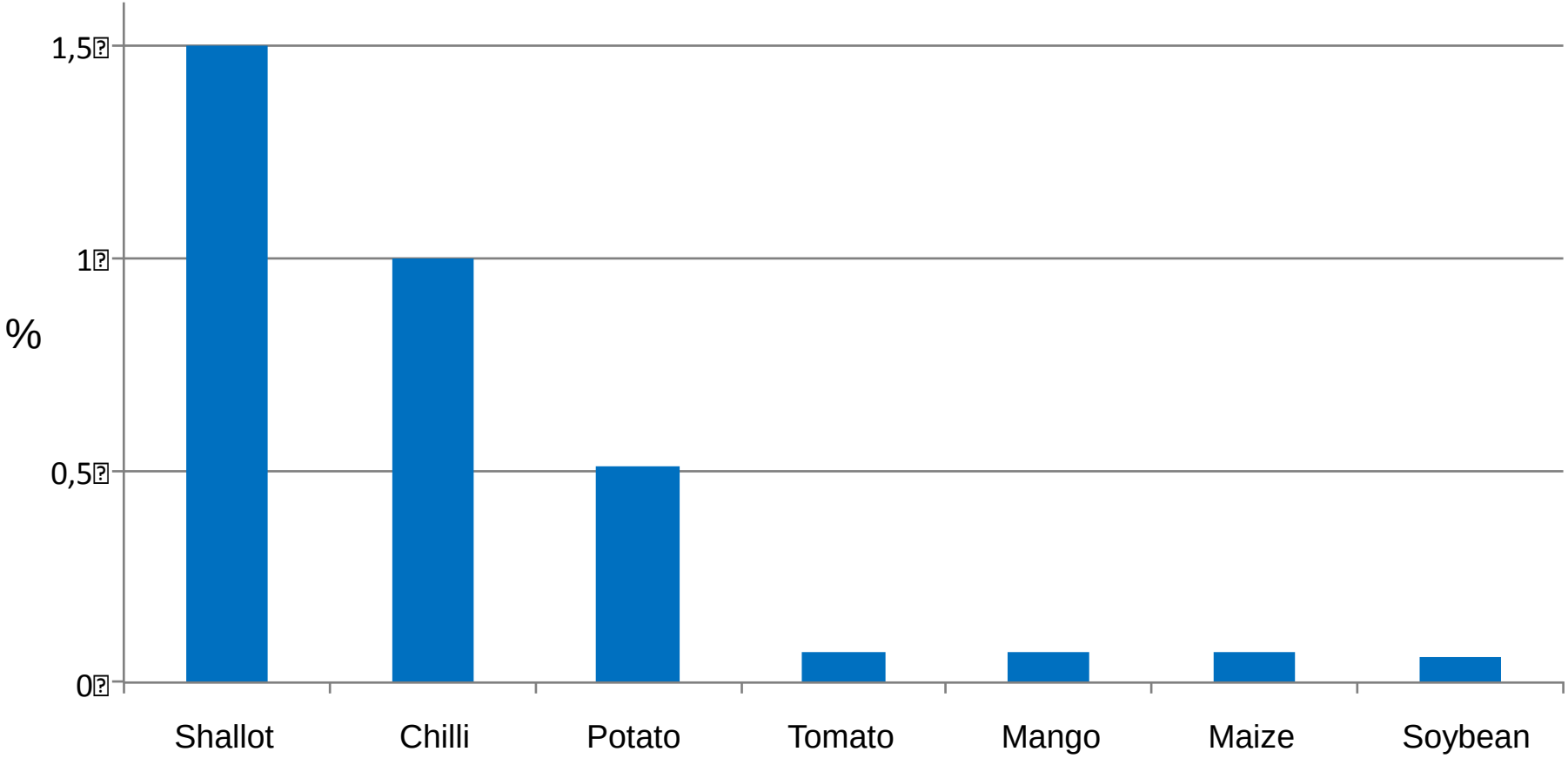
Growth (2007-12)

There is wide variation in growth patterns across commodities



Exports (2011)

Exports account for a marginal share of domestic production



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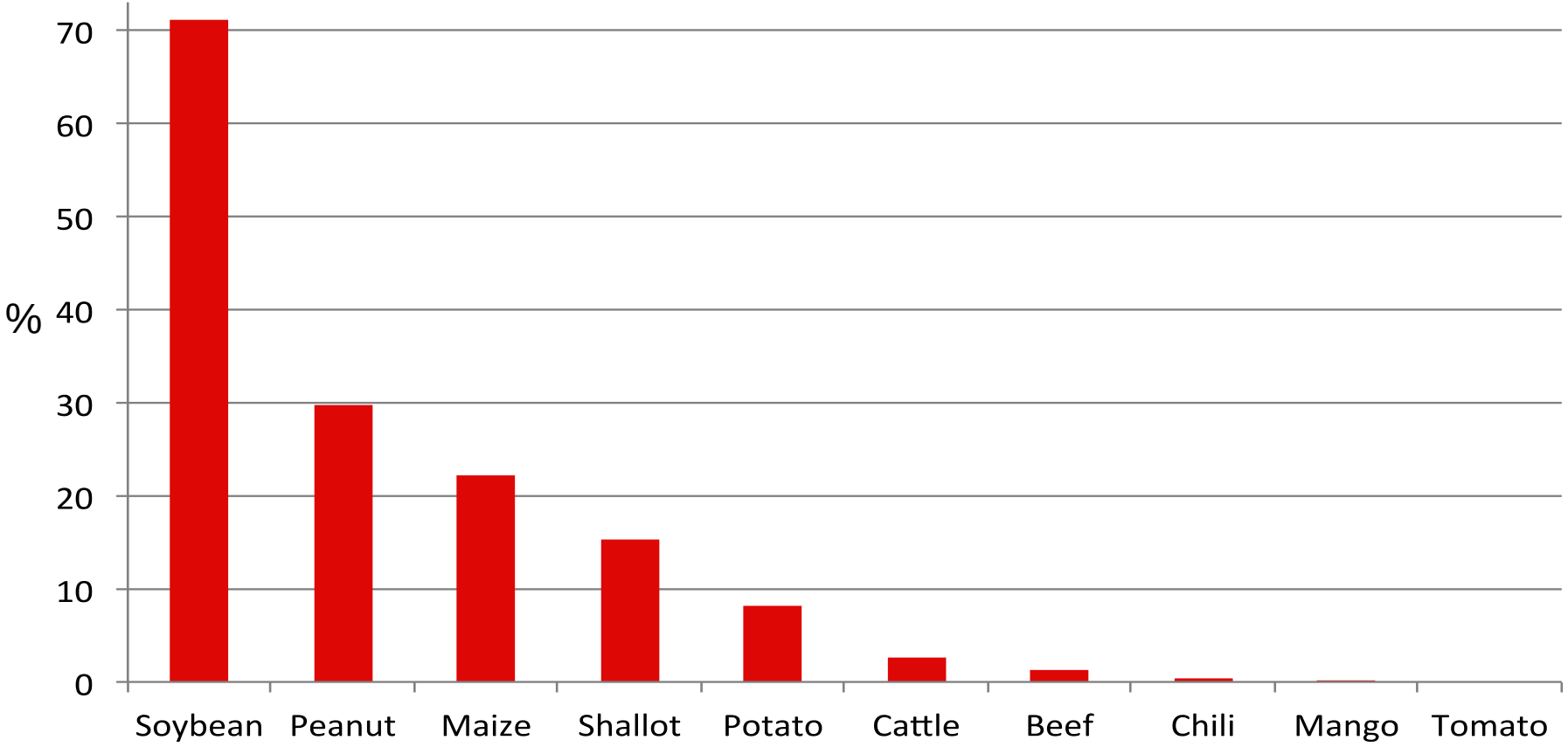
Imports (2011)

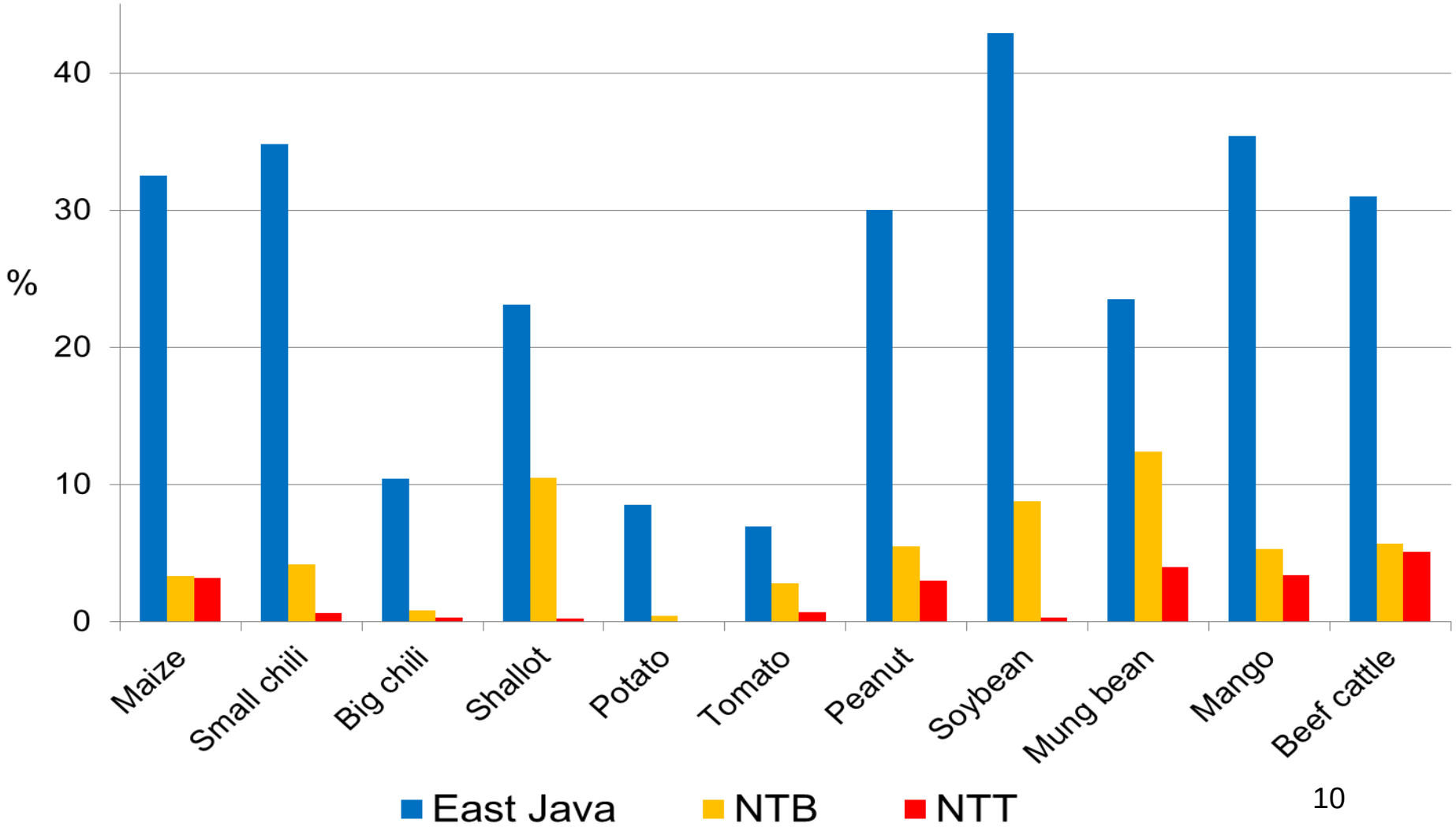
The share of imports in domestic supply varies considerably across commodities



3. Spatial patterns

EI Share of National Production (2010-12)

East Java stands out as an agricultural production centre



Production Areas

Commodities	Harvested area (ha)		
	East Java	NTB	NTT
Maize	1,244,927	116,950	240,107
Soybean	220,815	62,888	2,691
Peanut	213,792	38,890	21,563
Mango	76,532	10,696	7,446
Chilli	63,185	5,247	1,981
Mungbean	55,881	27,775	13,183
Shallot	22,323	12,333	725
Potato	10,391	337	85
Tomato	4,663	1,333	1,114

Source: BPS

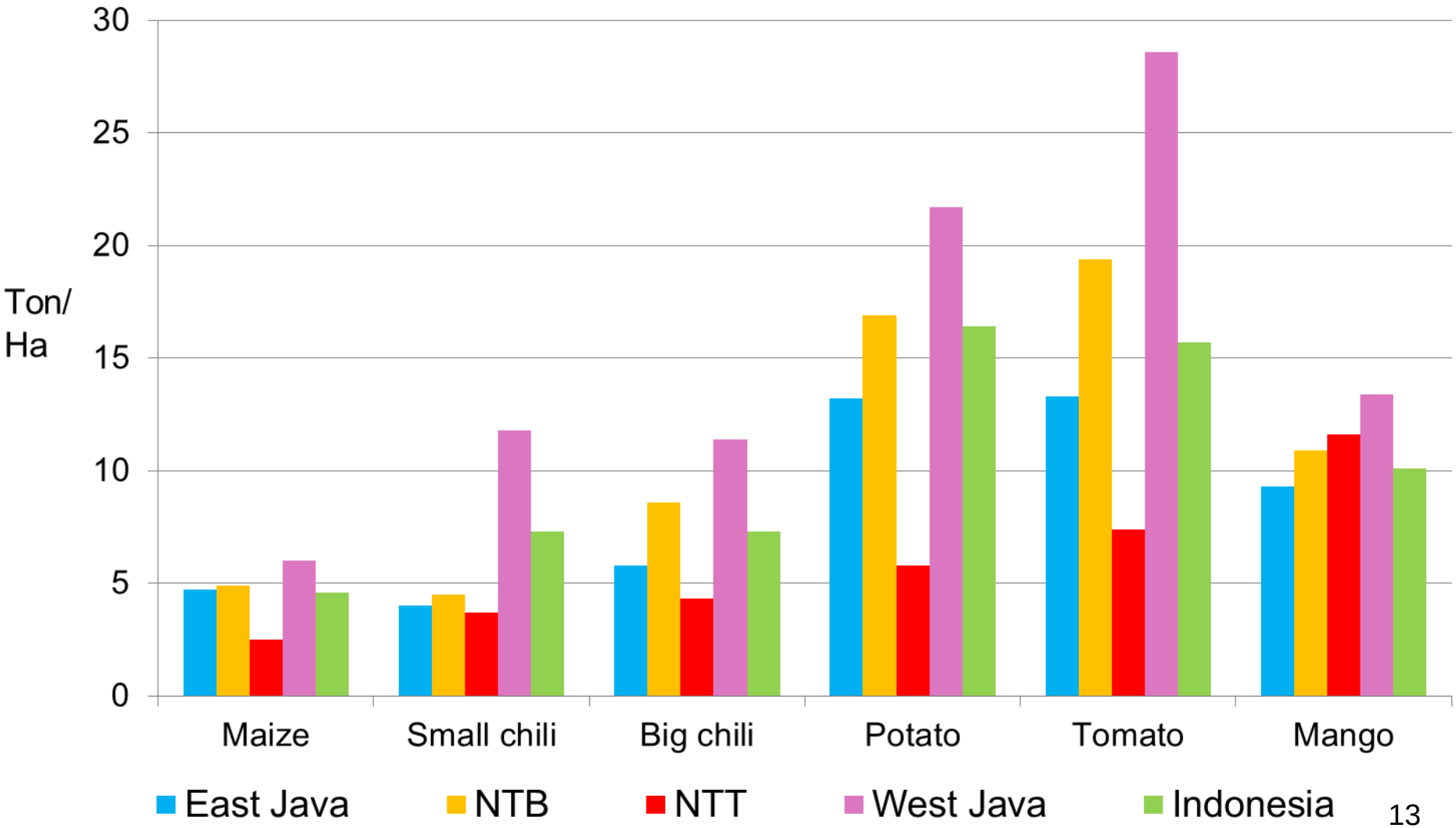
Growth (2007-12)

EJ and NTB had a much better growth performance than NTT

Commodities	East Java		NTB		NTT	
	Change in yield %	Change in production %	Change in yield %	Change in production %	Change in yield %	Change in production %
Small chili	25.4	73.6	28.1	(19.7)	(31.3)	15.2
Maize	37.2	48	95.7	432.8	10.8	22.4
Soybean	29.8	43.6	(1.9)	8.4	1.2	78.2
Big chili	(6.8)	35.1	16.6	69.2	(41.9)	(17.5)
Tomato	32.1	86.6	87.5	149.5	(52.2)	(17.6)
Cattle	n.a.	83.2*	n.a.	80.5*	n.a.	46.6*
Mango**	35.6	27.1	(19.7)	10.5	(23)	19.4
Shallot	9.3	(2.3)	(11.2)	12	(38.2)	(71.2)
Potato	26.1	79.3	52.9	255.5	(59.9)	(74.9)
Peanut	11.1	8.6	18.1	18.2	(5.1)	1
Mung bean	6.8	(16.8)	32	(16.6)	3.4	(44.8)

Farm Productivity

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



4. Chain Structure

Farm Size

- Small farms dominate livestock and farming landscapes

  ⇒ *Livestock*

  3-4 cattle heads in East Java

  4-7 cattle heads in NTB and NTT

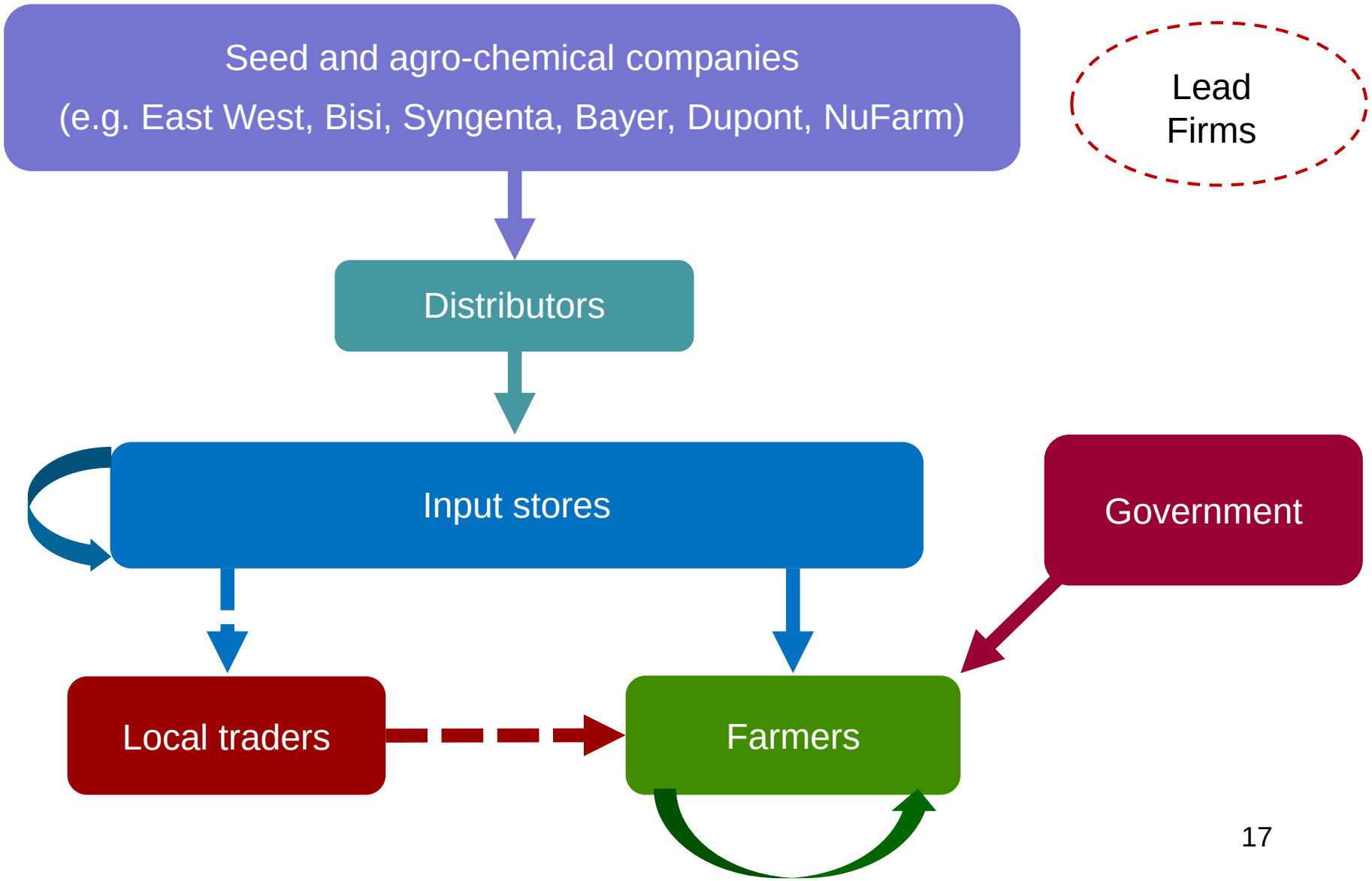
  ⇒ *Crop production*

  0.1-1 ha per crop per household

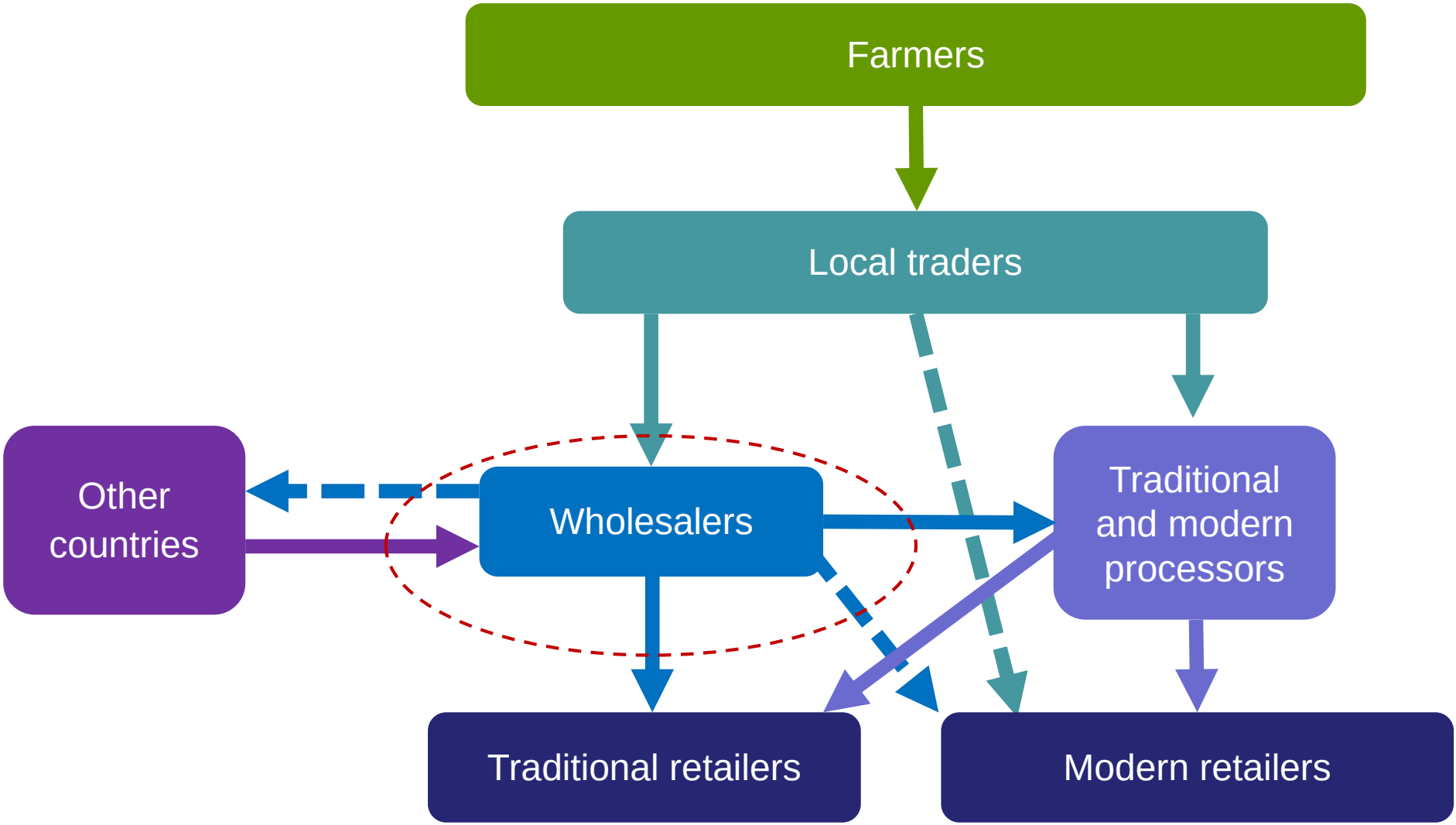
Collective Action

- A significant number of farmers 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 Chains (crops)



Generic Product Chains



Some Observations

- *traditional* vs *modern*
- *lead firms*
- *domestic* vs *export*

Processing Segment

	Relative Importance	Structure
Maize	*****	Concentrated
Beef	*****	Atomistic
Soybean	*****	Atomistic
Chili	***	Oligopsonistic
Peanut	**	Dualistic
Potato	**	Dualistic
Shallot	**	Dualistic
Tomato	*	Oligopsnonistic
Mung bean	*	?
Mango	*	Dualistic

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

Few households buy their fresh food mainly from hypermarkets and supermarkets

	% HH Surabaya, Bogor and Solo
Mango	8.9
Tomato	2.3
Potato	2.2
Shallot	1.4
Chili	1

Modern Retail Segment

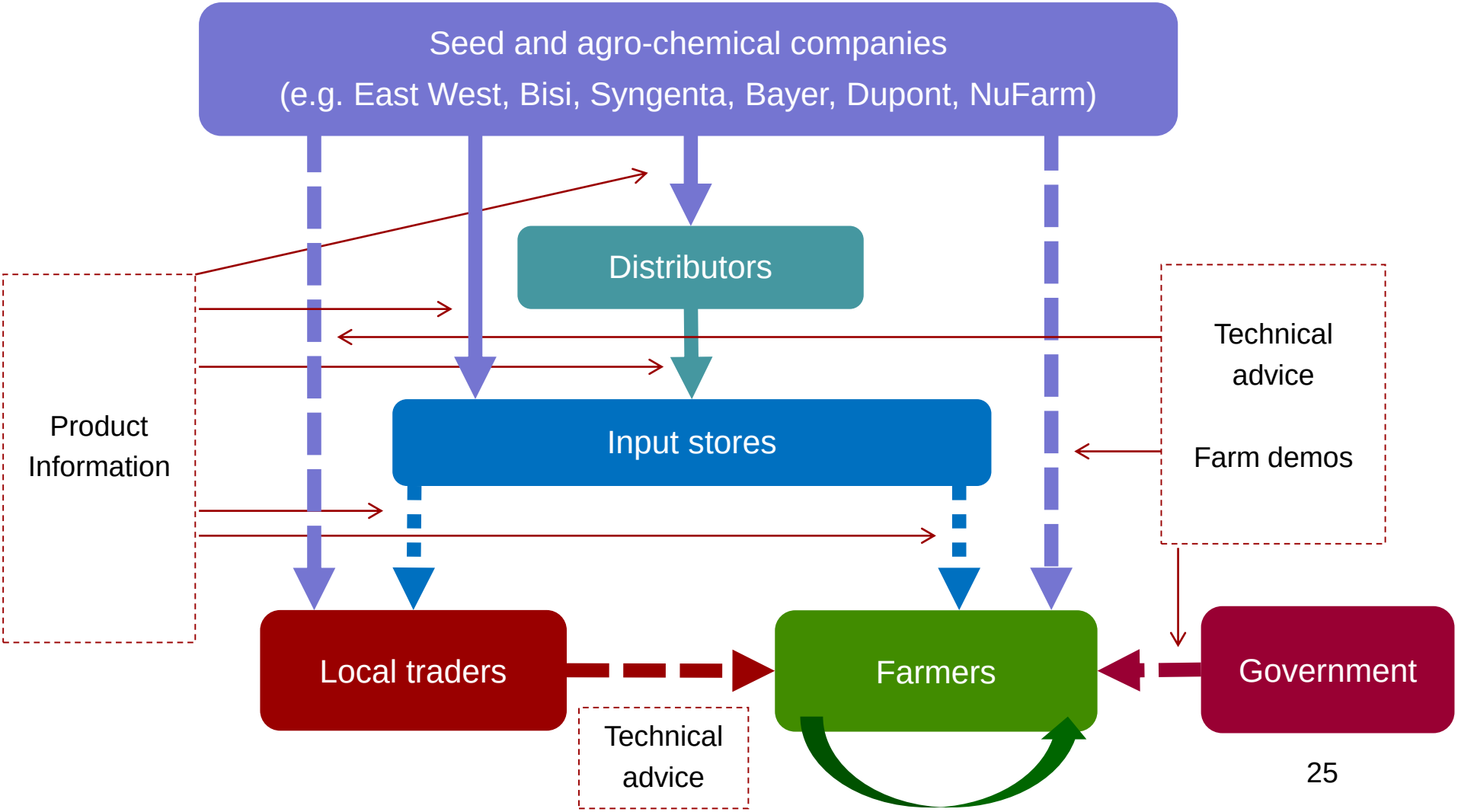
Supermarket outlets often function as independent procurement units, leading to fragmented modern retail structures

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)

5. Chain Conduct

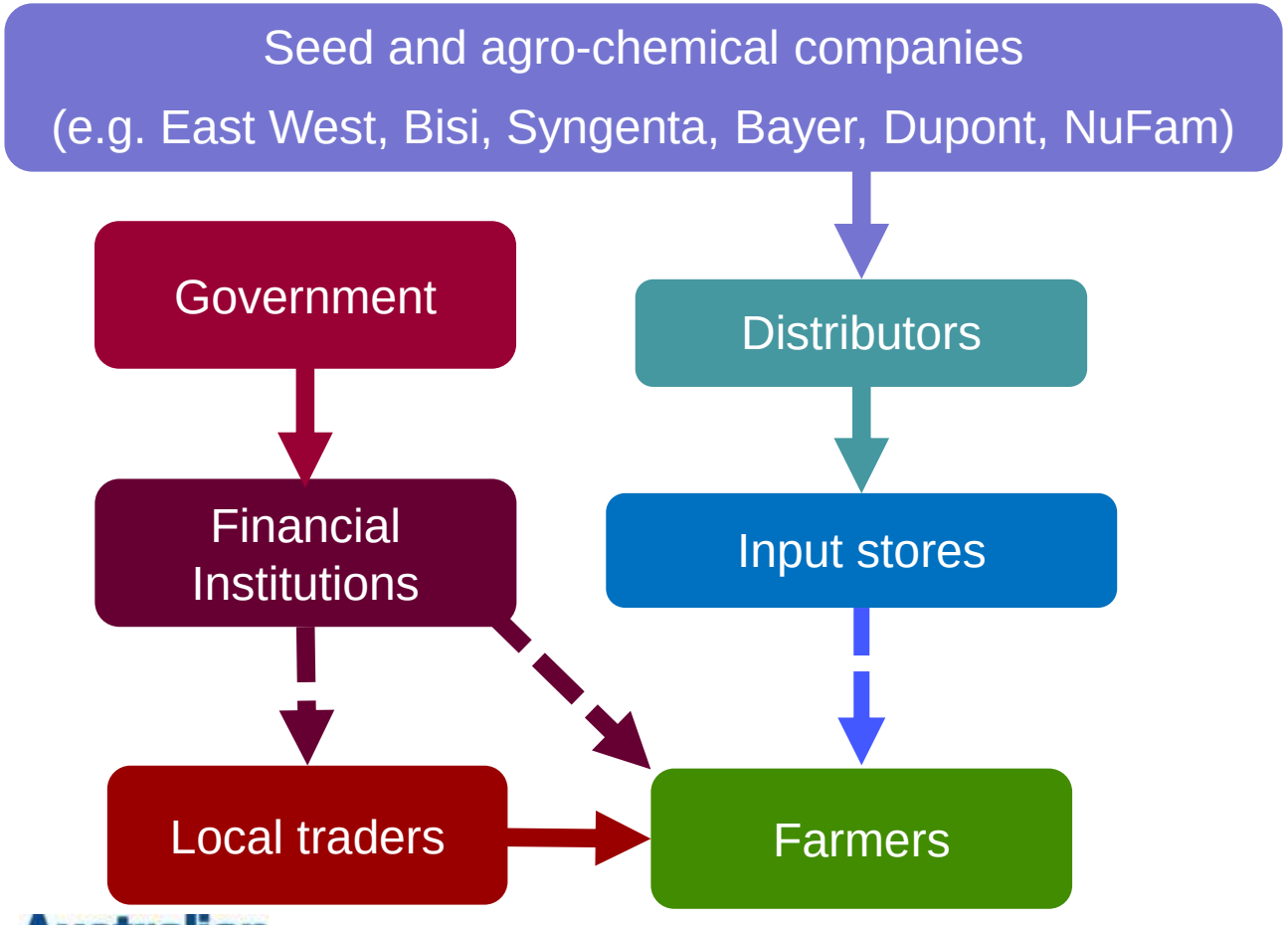
Knowledge Flows along Input Chains

Many systemic knowledge failures were identified



Credit Flows along Input Chains

Local traders are the main source of input finance for farmers



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
  - ⇒ Very few innovative agribusiness firms working with farmers

Vertical Coordination: Spot Market Transactions

- Spot market transactions are dominant
- Prompt payment is the norm
- Farm-gate prices are often a function of quality attributes, but in some chains the incentives for quality upgrading are low (e.g. soybeans, maize, farmers selling mango fruit on the tree)
- Farmers are constrained in their ability to take advantage of quality-upgrading opportunities (technical knowledge, investment capacity)

Vertical Coordination: Spot Market Transactions

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

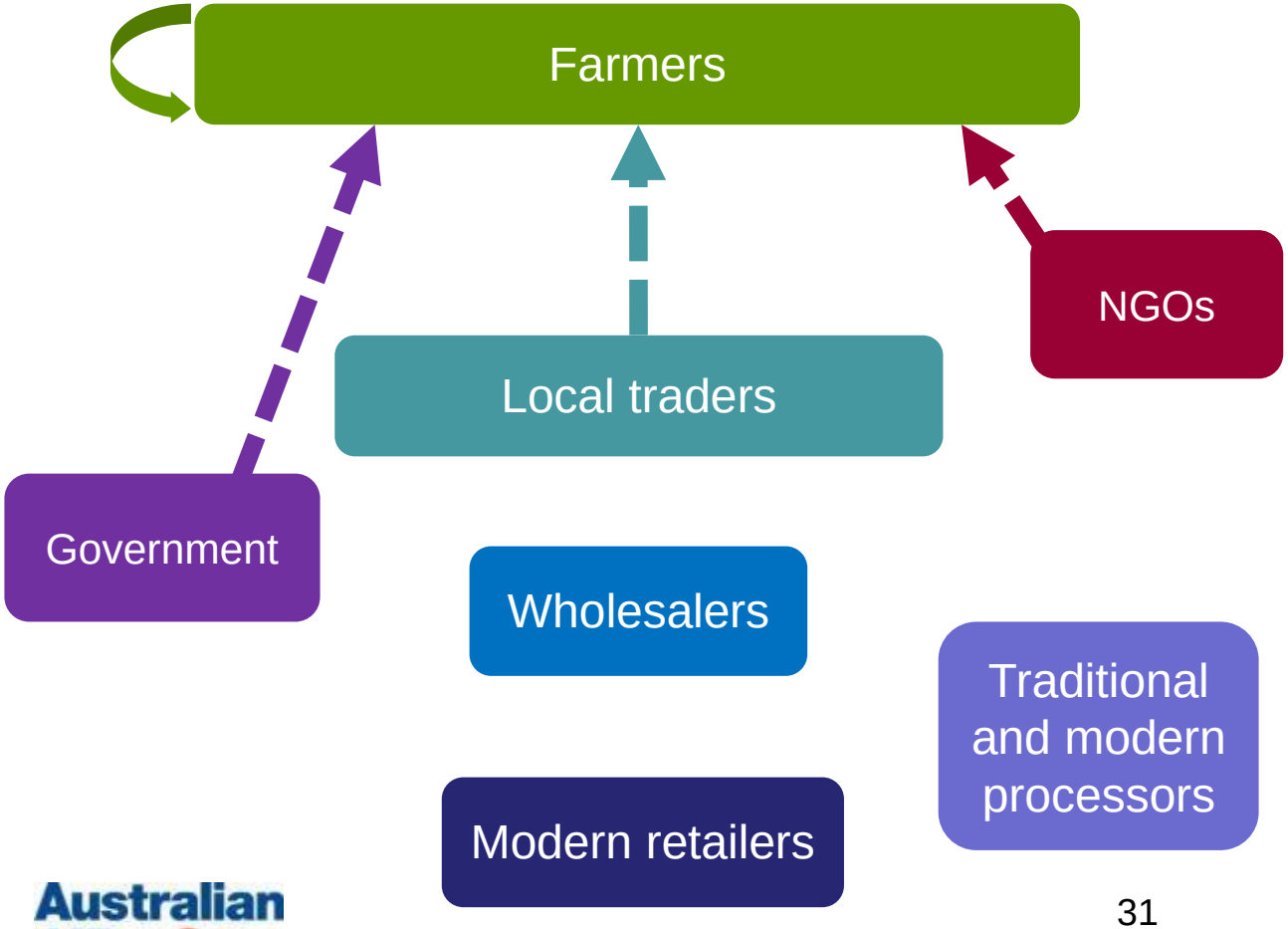
  ⇒ Transaction costs

  ⇒ Risk

- Long-standing business relations are common

Flows of Technical Knowledge

Flows of technical knowledge along product chains are very weak



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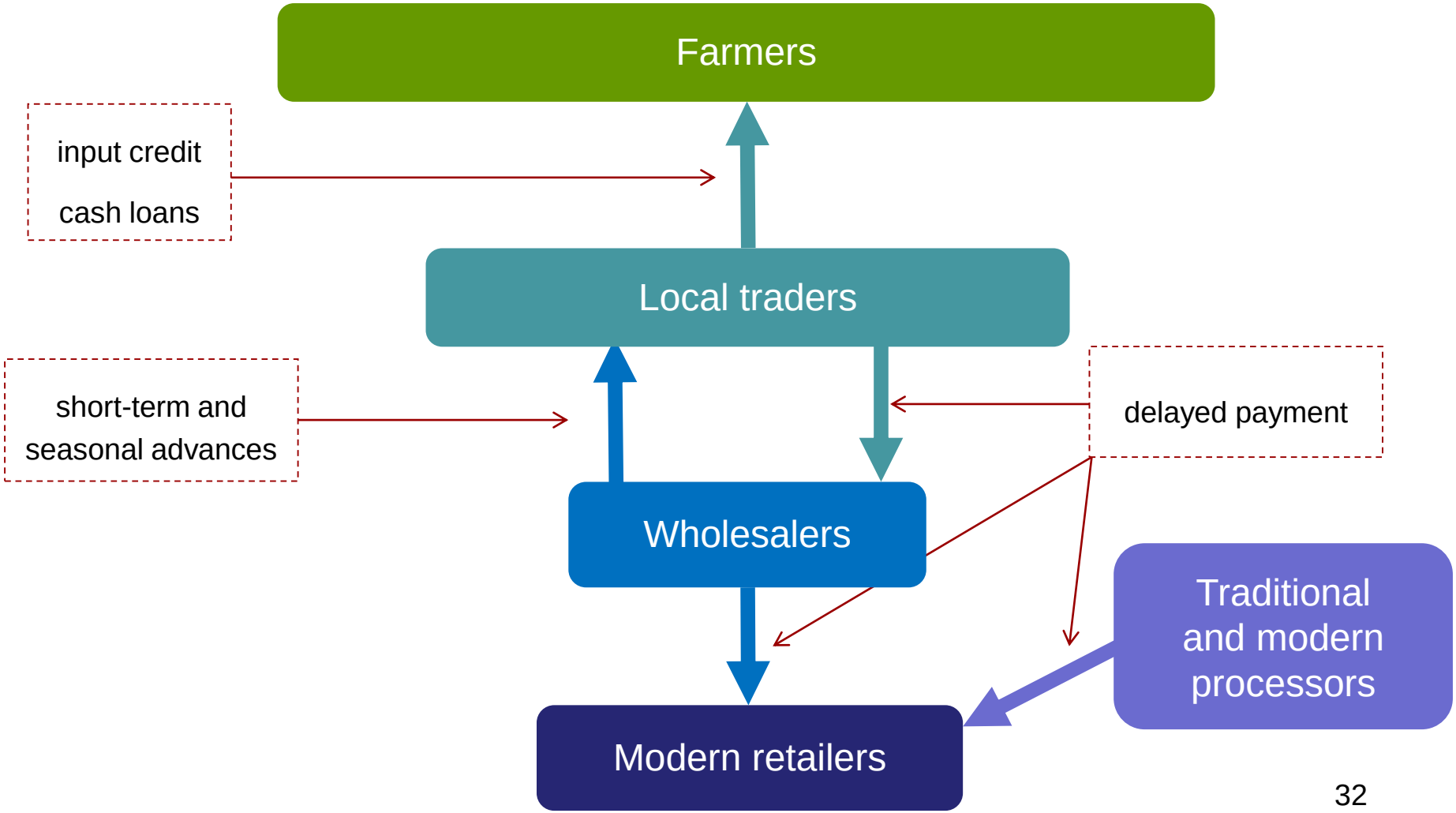
Main Credit Flows

Local traders are the main source of chain finance for farmers



Vertical Coordination: Contract Farming

- Contract farming is common in the seed, poultry, and tobacco chains

- But not in the chains surveyed, where lead firms tend to show a preference for spot market purchases

  ⇒ risk of side-selling / strategic default

  ⇒ Poorly-developed premium chains

  ⇒ imports often offer a cheaper alternative

Scale and Performance of Contract Farming Schemes

Most contract farming schemes have limited outreach
There are significant differences in their performance

Firm	Crop	Location	No. 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

Vertical Coordination: Modern Retail Segment

- Supermarkets are rather passive chain actors
- Heterogeneous in their procurement strategies

  ⇒ Quality standards

  ⇒ Systems (outlet-based *vs* DC)

- High prices, small volumes
- High sanctions for non-compliance
- Very late payment (1-2 months)

6. Chain Performance

Export Competitiveness

- Export competitiveness is very low
- Strong involvement of modern firms with close links to farmers is necessary for successful export development in the vegetable sub-sector
- Good opportunities were identified for mango, but significant chain innovation is required for success in export markets

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 Growth

Between 2007 and 2012, productivity growth has been high or very high for 6 of the 10 study 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	■		

Post-Harvest Losses

- High physical and quality losses were found during:

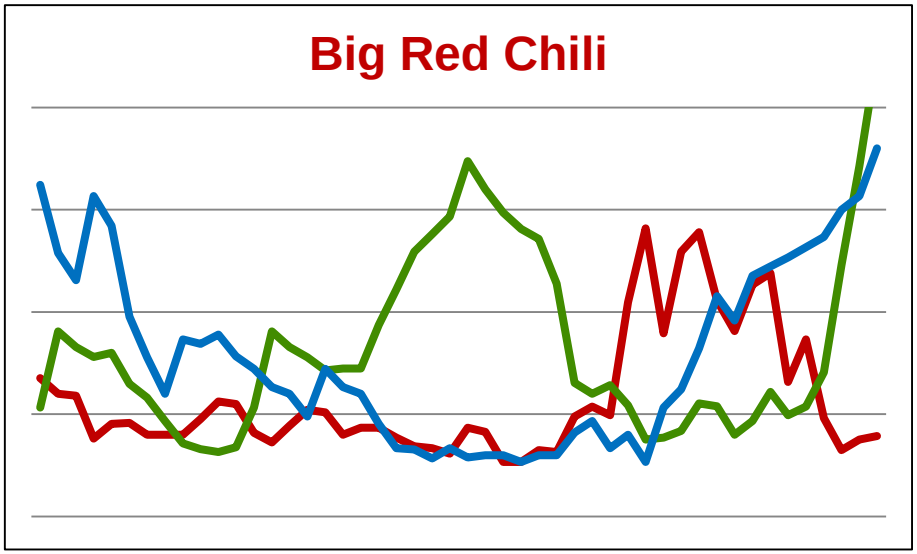
  ⇒ *Storage*: maize in NTT and shallot bulbs for propagation and consumption

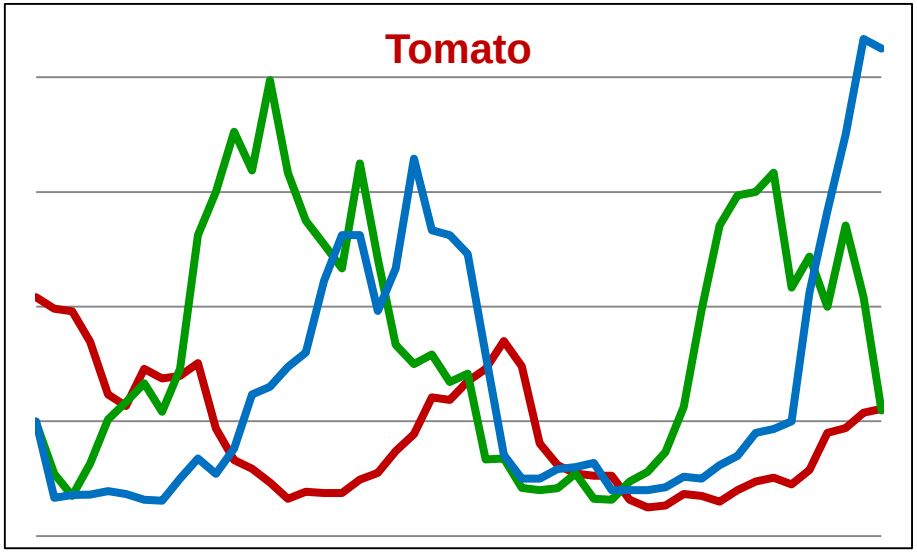
  ⇒ *Inter-island trade*: shipping of tomato to Kalimantan during the rainy season, mangoes to Sumatra (?), and live cattle from NTT

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 Price Volatility





- High for perishables

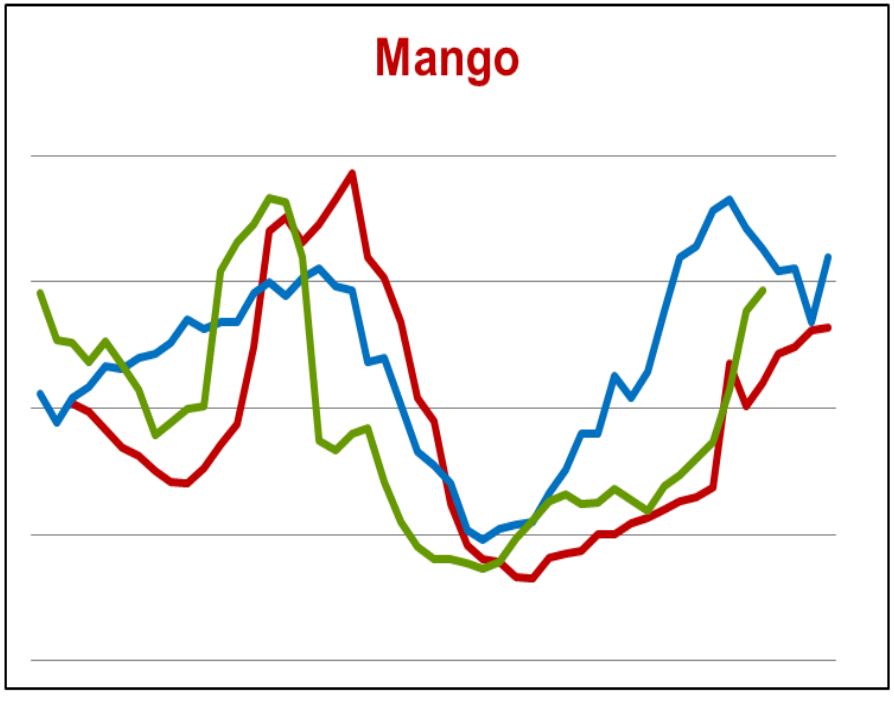
  ⇒ Weather

  ⇒ Product perishability

  ⇒ Lack of cold storage

  ⇒ Import policies

Seasonal Price Variations



- High for mango:

  ⇒ incipient development of exports and processing

  ⇒ Limited adoption of crop manipulation technologies

- For some other crops, e.g. shallot or maize in NTT, import restrictions and poor storage exacerbate inter-seasonal price variations

7. Cross-Cutting Issues

Participation of the Poor

Investment costs (and risks) may limit participation of the poor

Wage employment impacts need to be considered as well

	Farm Production cost (excl. household labour) IDR '000 / Ha	Wage employment No. Person days / Ha
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 (1)

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

- Heavily involved in farm production, but farms are usually managed by men
- Much less involved in producer groups than men
- Gender gap in farm wages
- Farm sales are generally conducted by men

Participation of Women (2)

- Participation rates at different stages in the chain vary across commodities
- Strong presence in the retail trade
- 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

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

Afternoon session

8. Opportunities for pro-poor innovation

Pathways for Increasing Smallholder Incomes

Increases in farm productivity offer the main opportunities for income impacts

	Productivity	Price
Maize		
Vegetables		
Legumes		
Mango		
Cattle		

Entry Points for Innovation

	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 schemes is often inadequate

9. Lessons and Implications for Pro-poor Development

Government

- Import policies
- Agricultural extension
- Working with the private sector

Private Sector

- Contract farming
- Capacity to support farm-level innovation

Development Programmes

- Commodity- or agribusiness-centred approaches?
- Area-based or chain-centred approaches?
- Action-research or development?
- Targeting agents of change
- Farmer groups or traders?
- Lead firms or traditional traders?
- Contract farming or spot markets?
- Modern retail or traditional chains?
- Working with large government programmes

Issues for Research

- Policy
- Government programmes
- Varieties
- Seed supply systems and business models for OPVs and vegetatively propagated crops
- Pests and disease management
- Factors hindering technology adoption
- Technology commercialization models

Issues for Research

- Farm-gate price incentives for investment in quality
- Economics of storage solutions and opportunities
- Losses in inter-island trade
- Economics of post-harvest technologies
- Processing
- Contract farming
- Export market opportunities