

Eastern Indonesia-Agribusiness Development Opportunities

**Stakeholder
Consultation Workshop
Chilli**

Surabaya, Indonesia 26th September, 2013



Collins Higgins Consulting



Australian Government
Australian Centre for
International Agricultural Research



Eastern Indonesia Agribusiness Development Opportunities (EI-ADO)



- Research commissioned by ACIAR, implemented by Collins Higgins Consulting and Indonesian partners
- EI-ADO project objectives:
 - Identify five commodity value chains linked to NTB, NTT and East Java with most potential to increase income of poor farmers
 - Identify opportunities and interventions with most potential for improving the efficiency, competitiveness and income of poor farmers
- Information and recommendations from EI-ADO study to inform DFAT in the design of the Australia Indonesia Partnership for Decentralisation – Rural Economic Development Program (AIPD-Rural).
 - \$112 million DFAT funded development program targeting Eastern Indonesian

AIPD-Rural



- **Goal:** Increase the net income of 1 million poor male and female farmers by at least 30% by 2022 (300,000 of which should be reached by 2017)
- **Objective:** to increase the competitiveness of poor male and female farmers
- **Strategy:** To address the “systematic” constraints of the agricultural sectors that are important to the poor in selected districts
- **Outcomes:**
 - Improved farm practices
 - Increased access to input and markets
 - An improved sub-national business enabling environment
- **Approach:** Market Development or M4P

EI-ADO Methodology

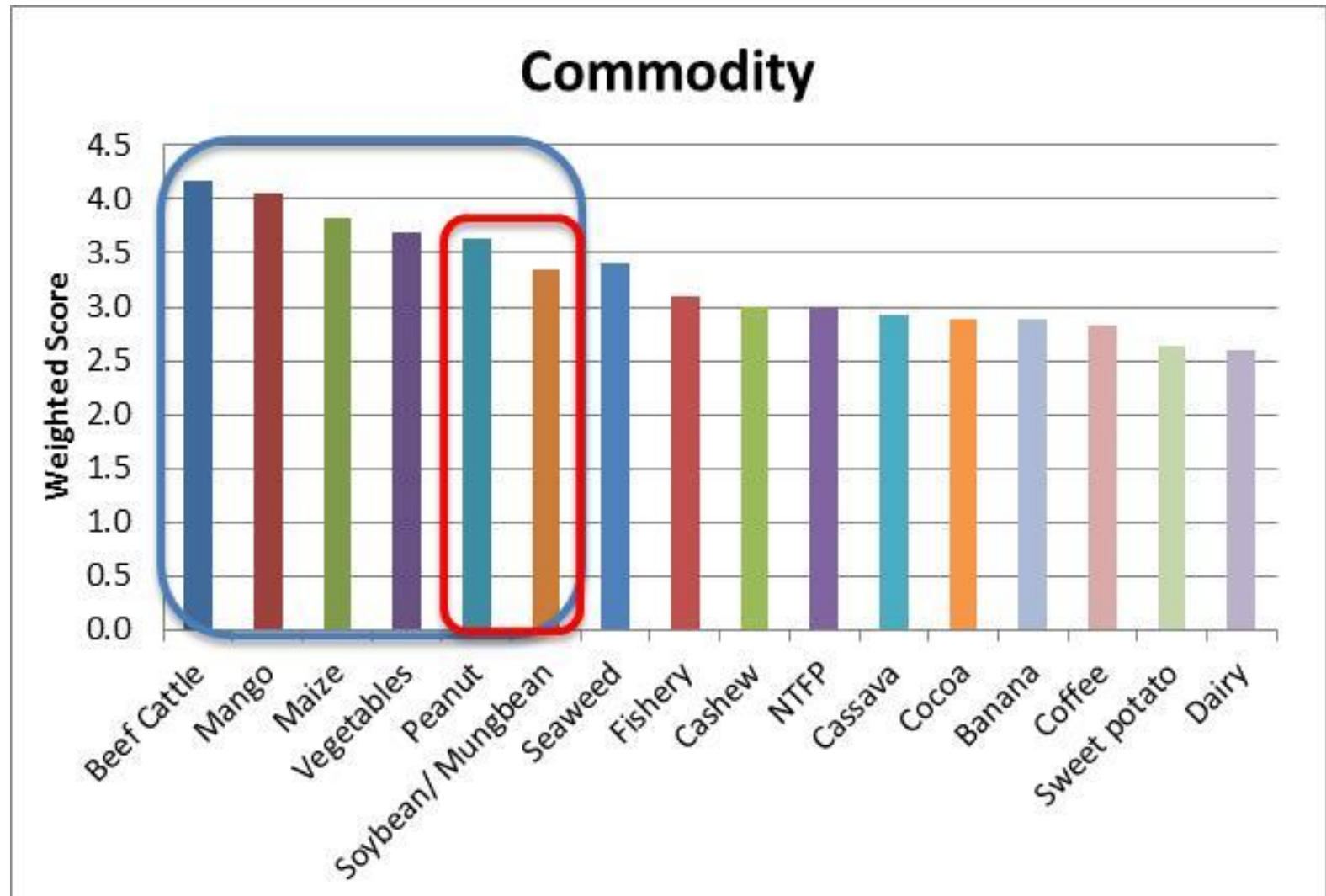


- Initial identification of 32 commodities
- Reference Group selected down to 16 commodities
- 16 commodity literature reviews preformed
- Provincial and Reference Group consultation for commodity prioritization
- Identification of 5 priority commodities for detailed value chain studies.

1. Beef	
2. Legumes	Soybean, mungbean, peanut
3. Mango	
4. Maize	
5. Vegetables	Chilli, shallot, tomato & potato

Commodity Prioritisation

Commodities with most potential to increase income of the poor



Chilli Value Chain



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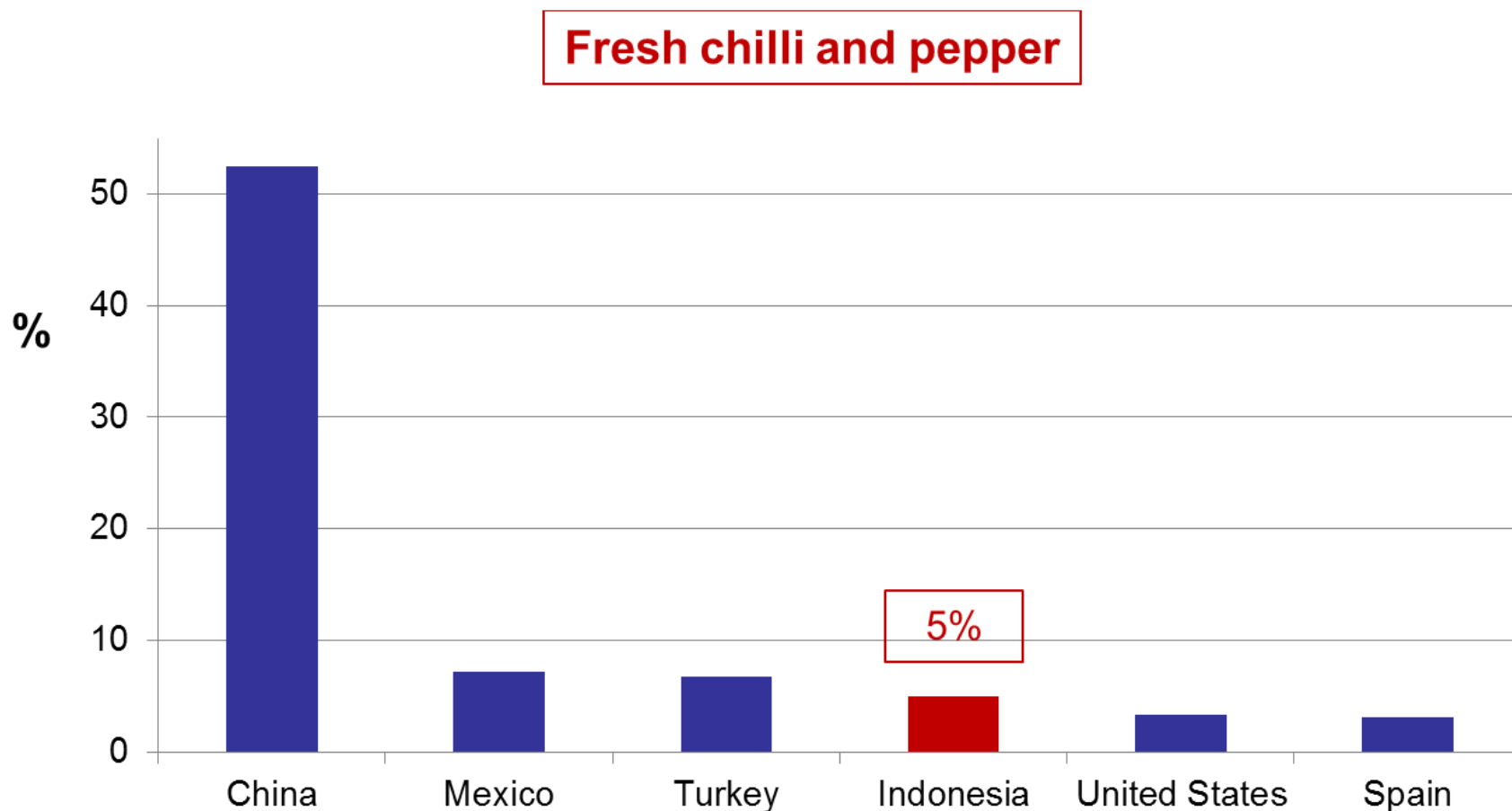


Areas Visited



- Sampang and Malang: selected for value chain research
- Batu: interview commercial farms, farmer groups, exporters, traders
- Kediri: visit nurseries and seed companies; develop an understanding of wider production and marketing systems
- Sidoarjo: visit markets
- Surabaya: visit markets and supermarkets

Indonesia's Position in Global Production (2011)



International Trade

- Exports of **fresh chilli** (and pepper) are very small
- Imports have been rising from a small base

	2007	2008	2009	2010	2011
Exports (tonnes)	1,362	1,218	555	1,504	1,448
Imports (tonnes)	301	501	905	1,850	7,501

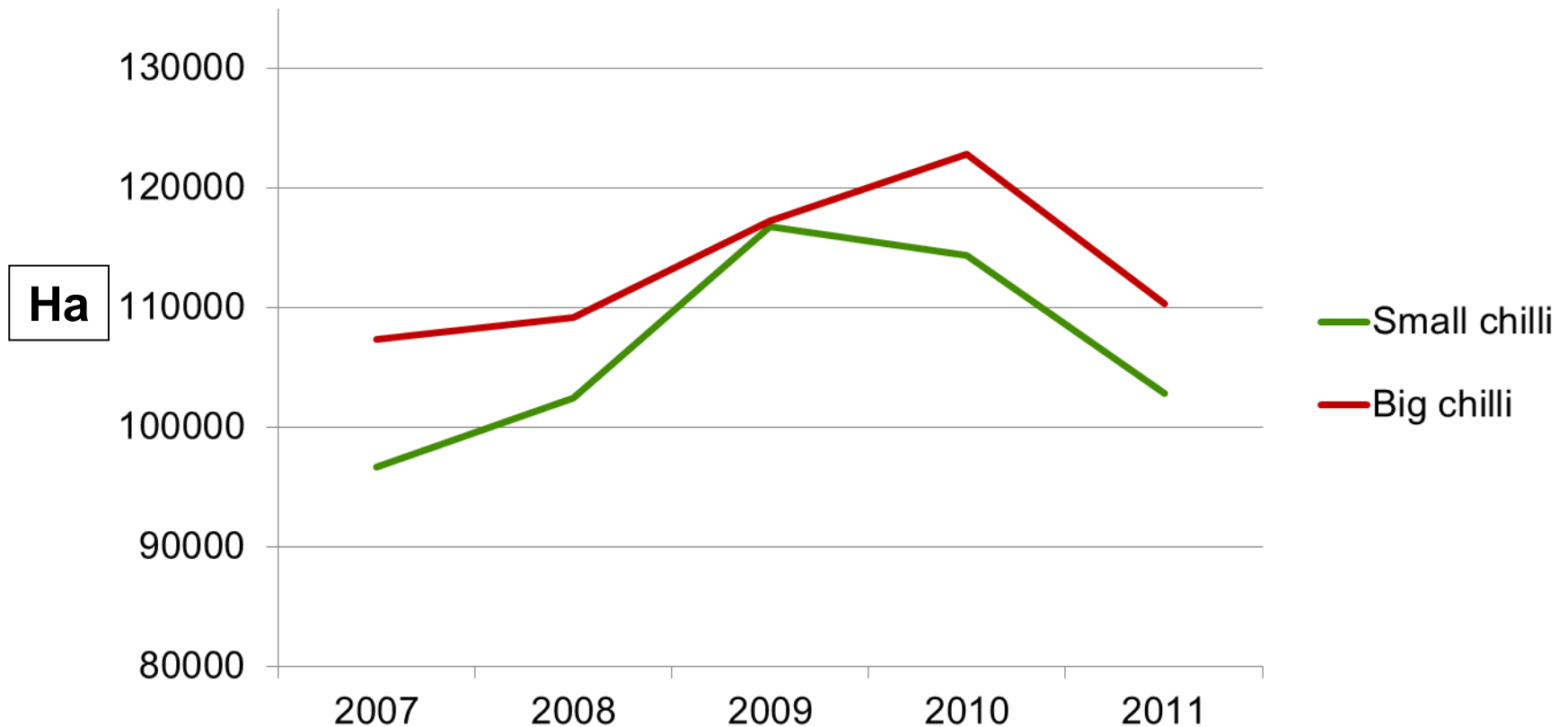
International Trade

- Exports of **dried chilli** (and pepper) are also small
- Imports are more significant and rising

	2007	2008	2009	2010	2011
Exports (tonnes)	958	557	1,539	1,688	1,263
Imports (tonnes)	11,439	14,891	15,516	16,541	19,998

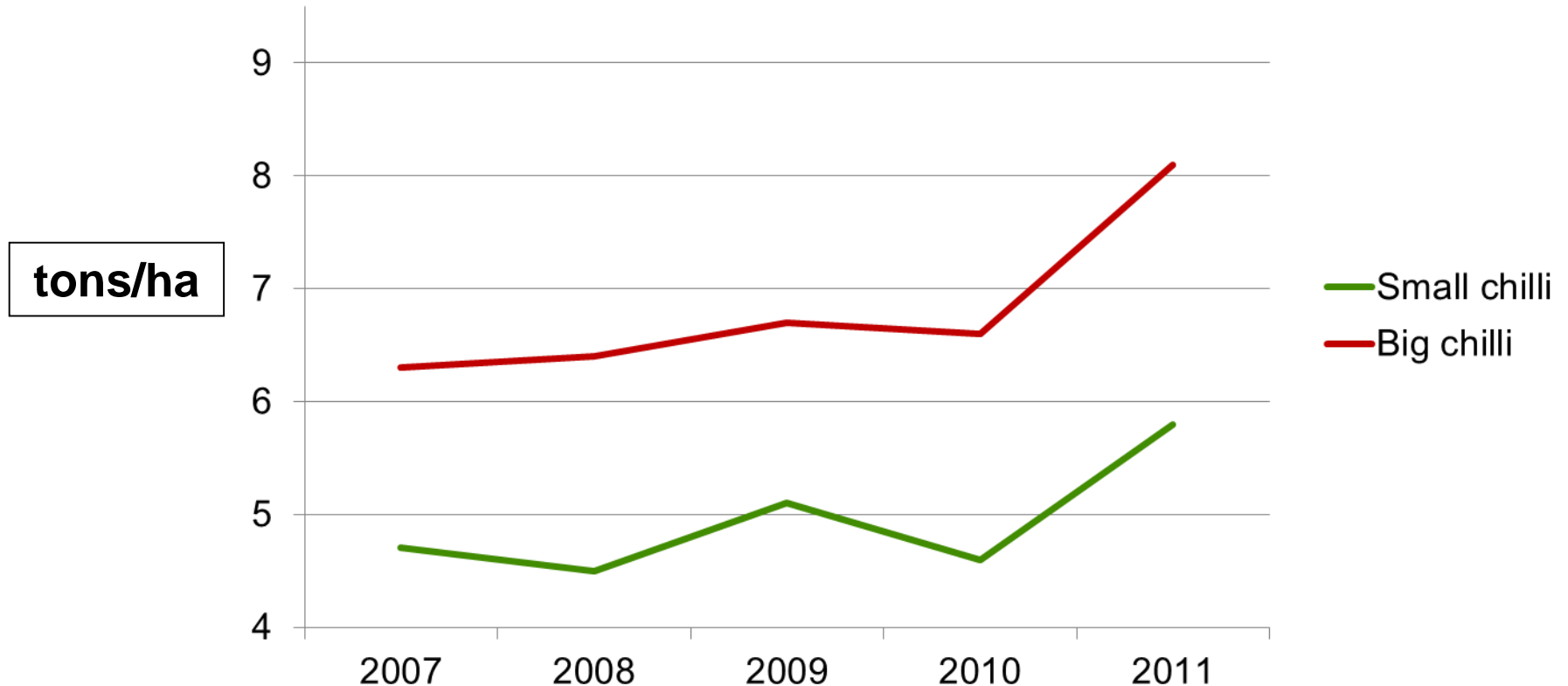
Production Statistics

- In the Indonesian vegetable sector, chilli accounts for the largest area



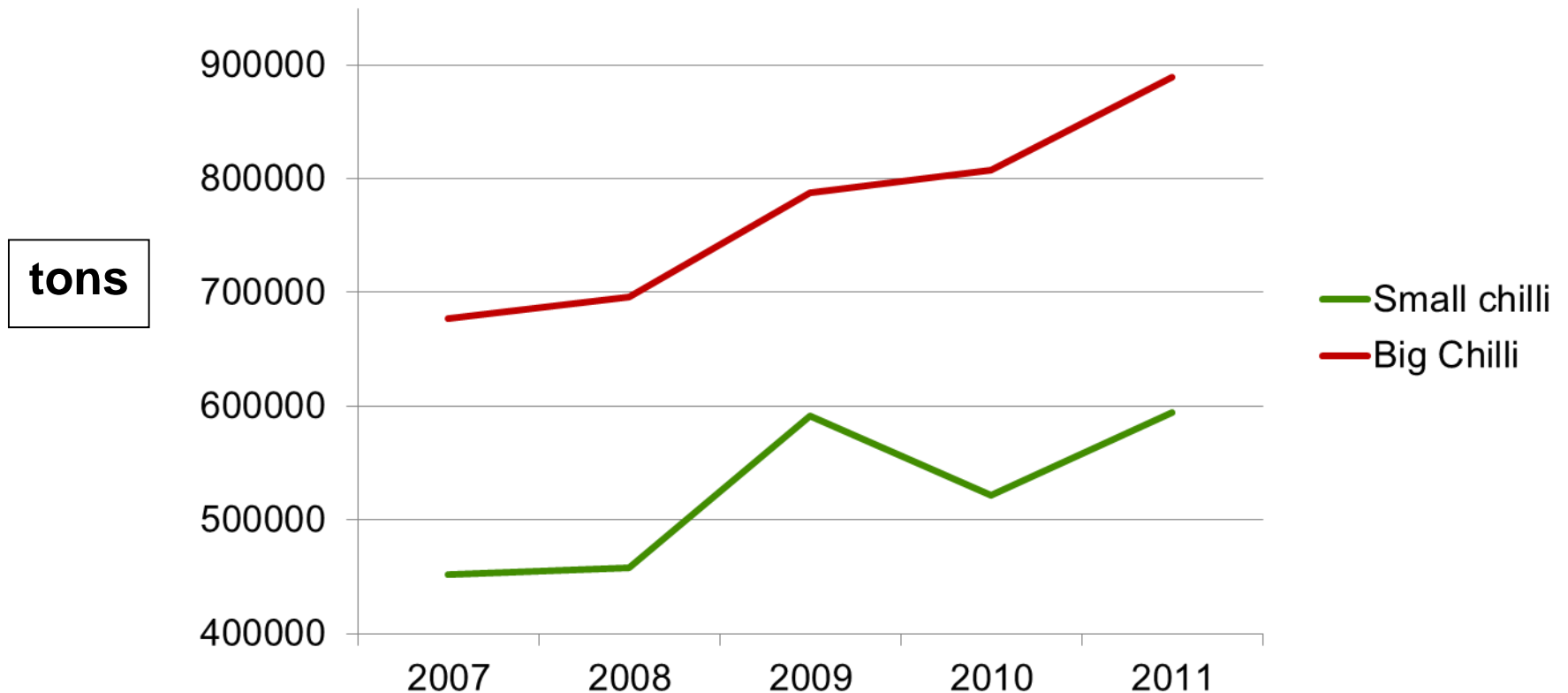
Production Statistics

- Are yields rising or was 2011 an exceptional year?



Production Statistics

- Production of small and big chilli is expanding



Geographical Distribution

- Small chilli** cultivation is concentrated in Java (particularly East Java)

	Average 2009-11	Share %
Indonesia (ha) of which:	102,760	100
East Java	43,602	42
Central Java	13,970	14
West Java	7,697	8
NTB	5,142	5

	Average 2009-11	Share %
Indonesia (Tons) of which:	569,075	100
East Java	167,237	29
Central Java	68,854	12
West Java	98,816	17
NTB	22,530	4

Geographical Distribution

- Big chilli** cultivation is concentrated in Java and Sumatra

	2009-11	Share %		2009-11	Share %
<u>Indonesia (ha)</u> of which:	116,758	100	<u>Indonesia (Ton)</u> of which:	827,815	100
Central Java	23,195	19.9	Central Java	131,232	16
West Java	16,041	13.7	West Java	190,446	23
North Sumatra	15,836	13.6	N. Sumatra	158,975	19
East Java	13,386	11.5	East Java	70,336	9
NTB	708	0.6			
NTT	622	0.5			

Provincial Yields



- West Java stands out in terms of the productivity of **small chilli** farms

	Average 2009-11	Change (%) 2009-11
<u>Indonesia (tons/ha)</u>	5.1	14
East Java	3.9	19
Central Java	4.9	-3
West Java	12.8	-6
NTB	4.2	-16

Provincial Yields



- North Sumatra and West Java stand out in terms of the productivity of **big chilli** farms

	Average 2009-11	Change (%) 2009-11
<u>Indonesia (tons/ha)</u>	7.1	17
Central Java	5.7	3
North Sumatra	15.8	59
West Java	12	5
East Java	5.3	1

Consumption



- **Small** (spiciness) and **big red** (colour) serve different purposes in processing and consumption
- **Small mixed colour** and **small green** have different uses in Indonesian cuisine

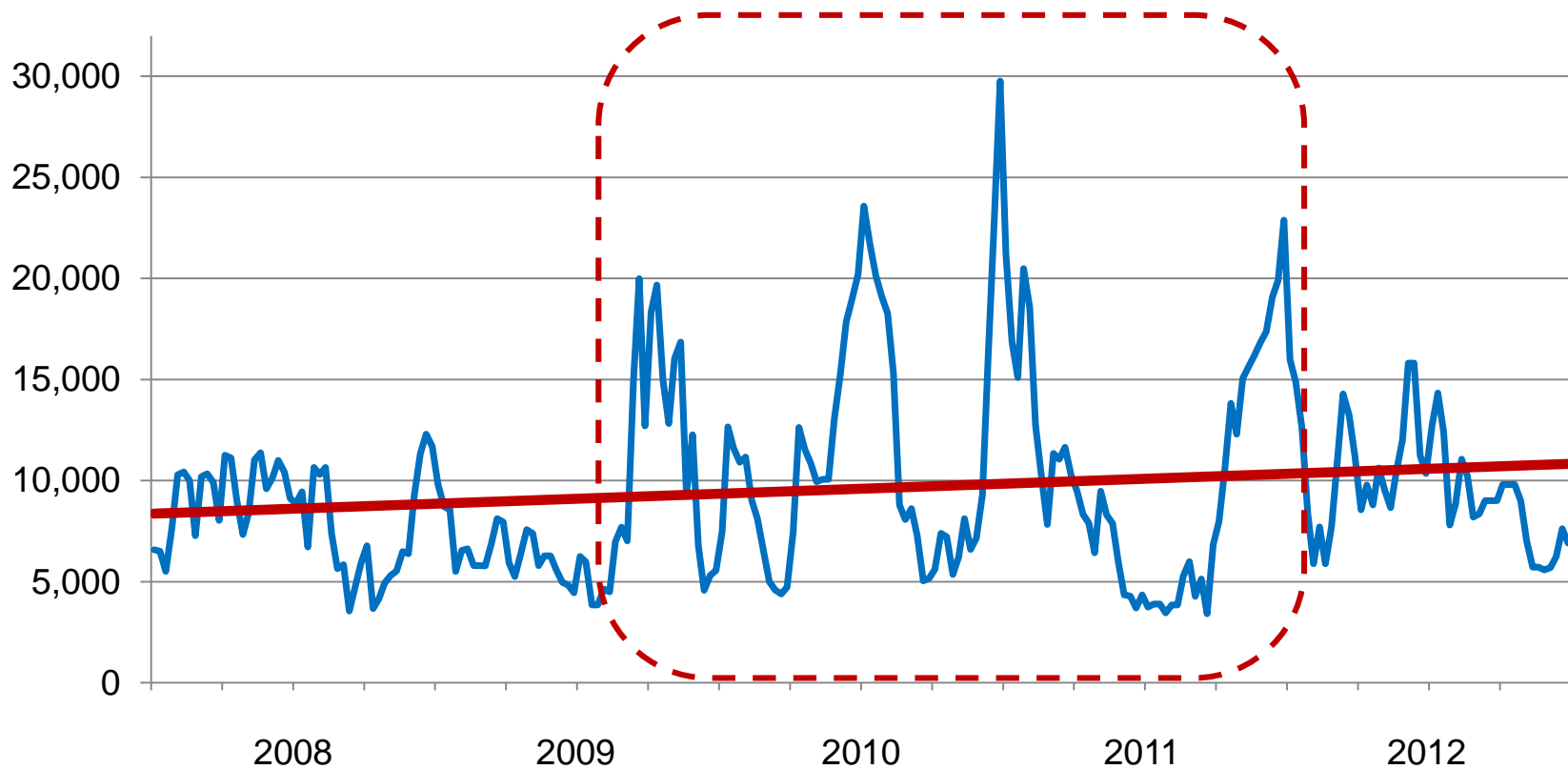
Consumption

- Different chilli types are not substitutes!
- Market for different chilli types is segmented

Late July	Small mixe oculou	Small green	Curly	Big red	Big green
Farm-gate price Malang			22,000		
Retail price Sidoarjo	62,000	14,000		18,000	9,000

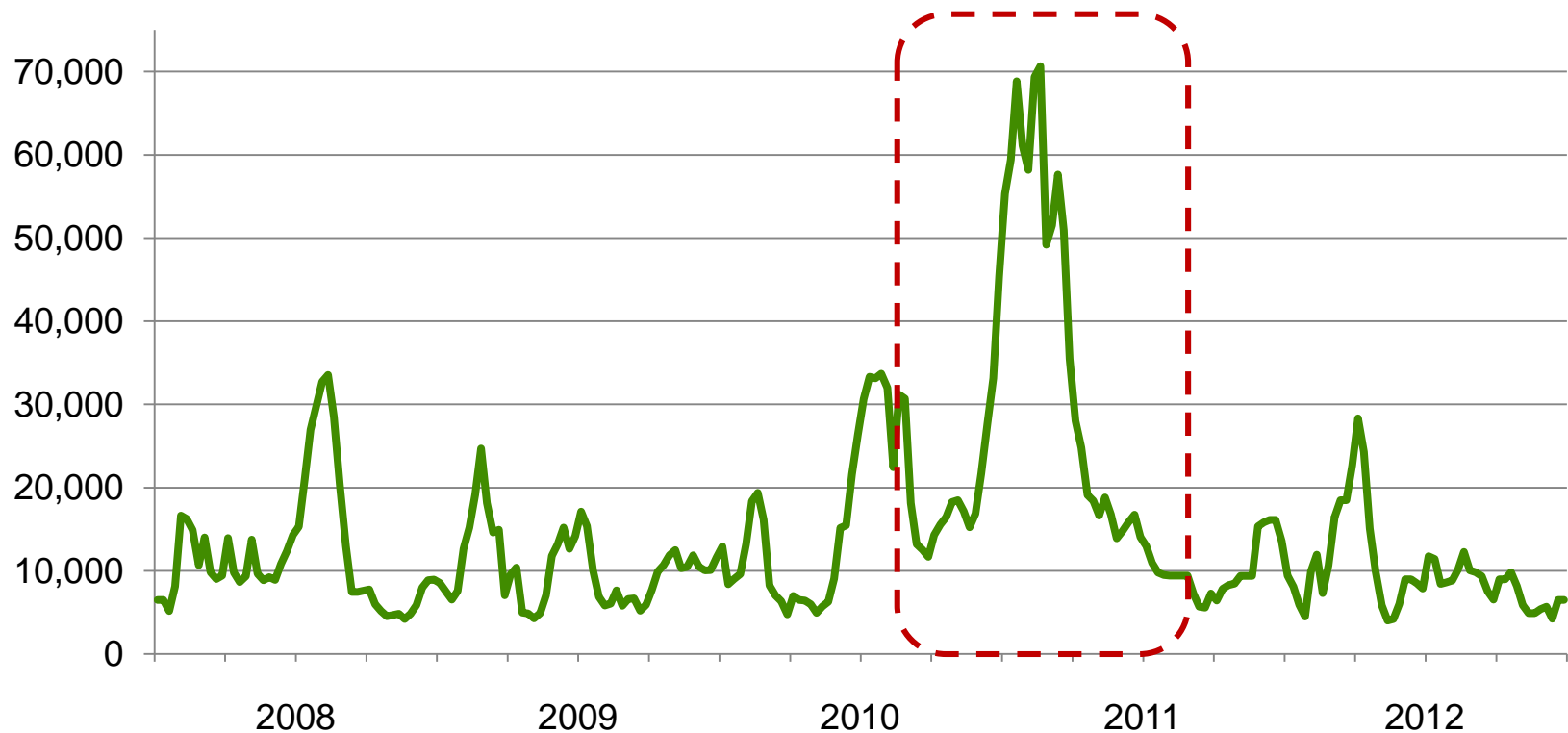
Real Price Trends

- Positive trend for **big red chilli**, with high volatility around the trend from mid-2009 to mid-2011



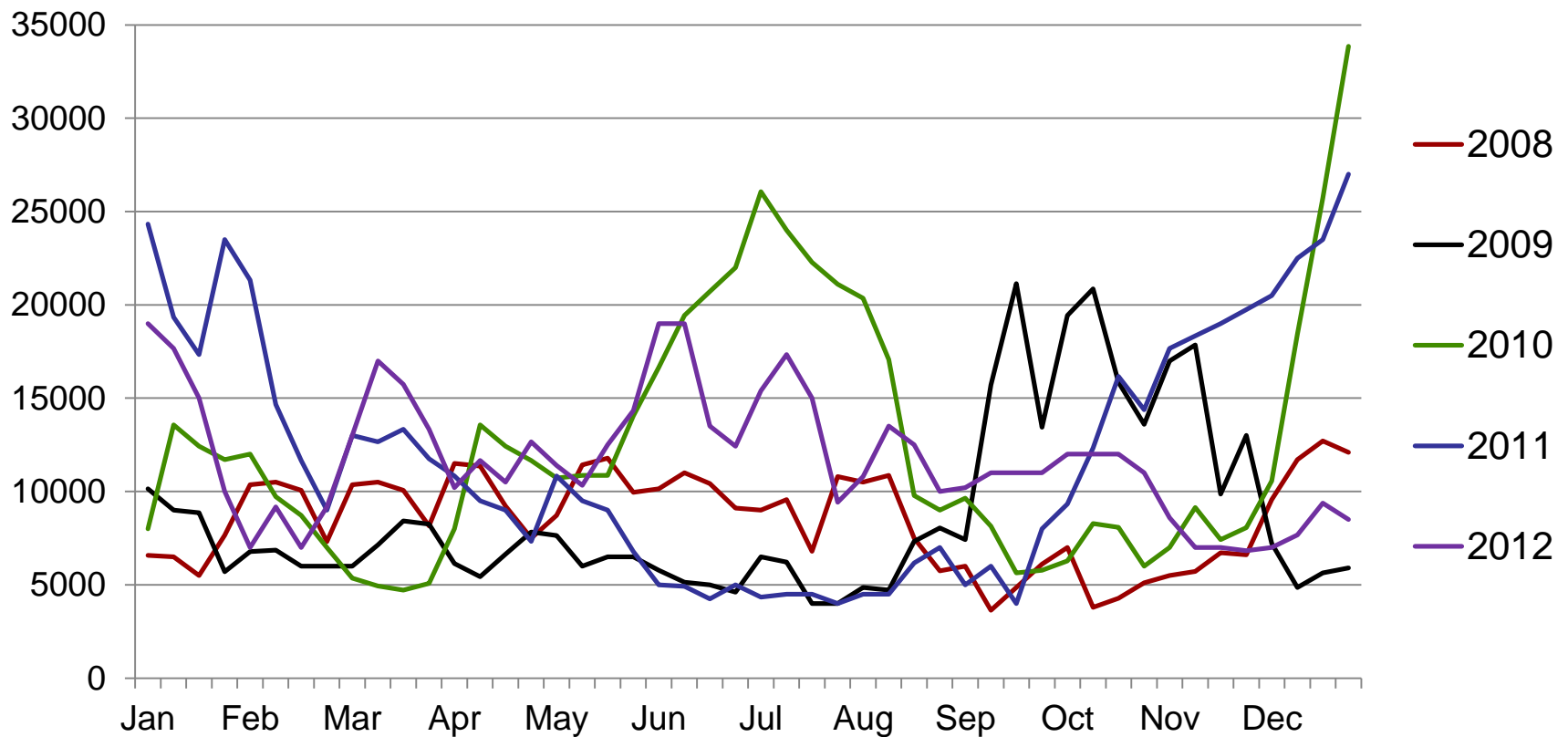
Real Price Trends

- Stagnant trend for **small chilli** (2010 was an exception)



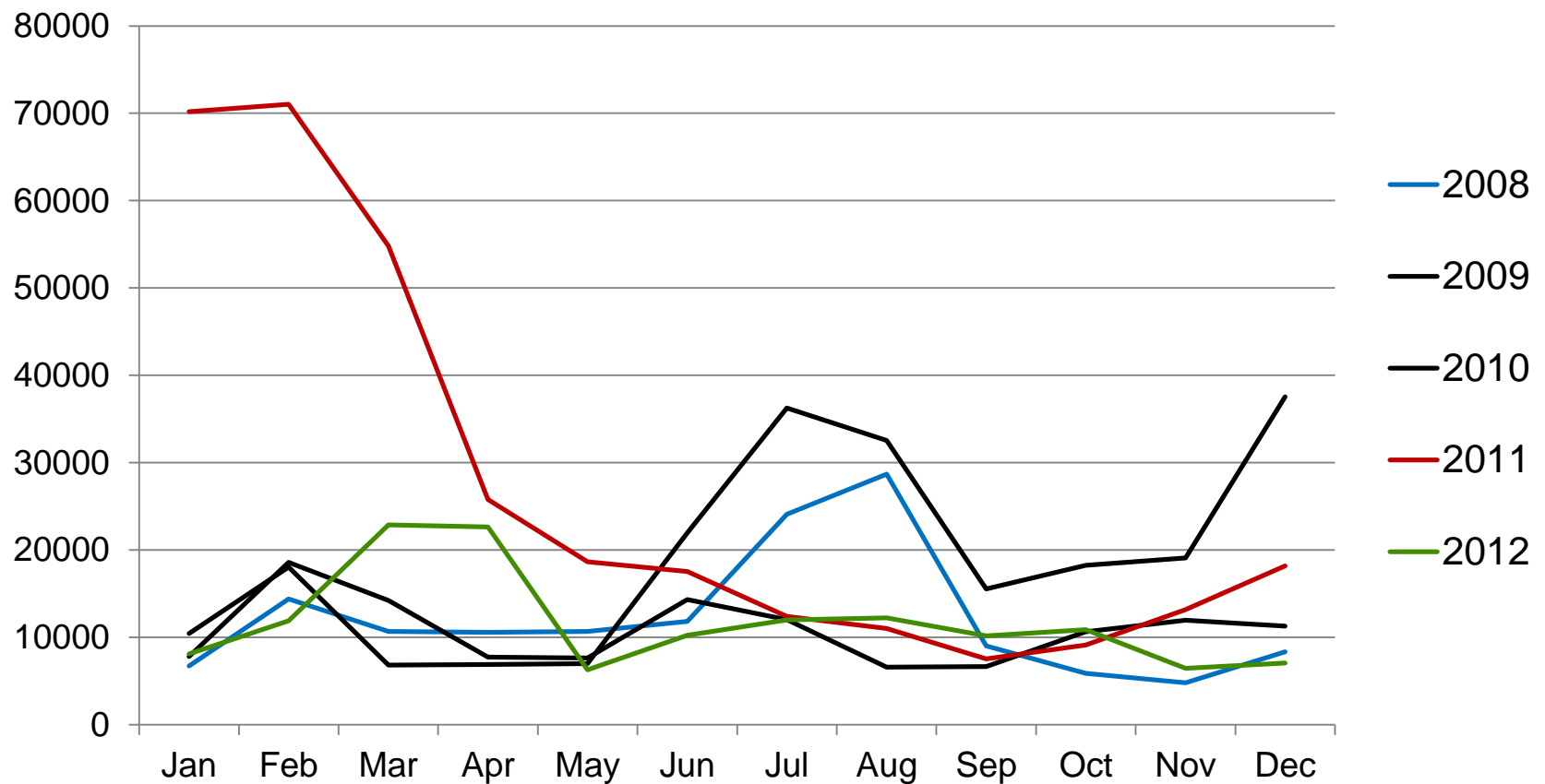
Price Seasonality

- No clear seasonal pattern for **big red chilli**

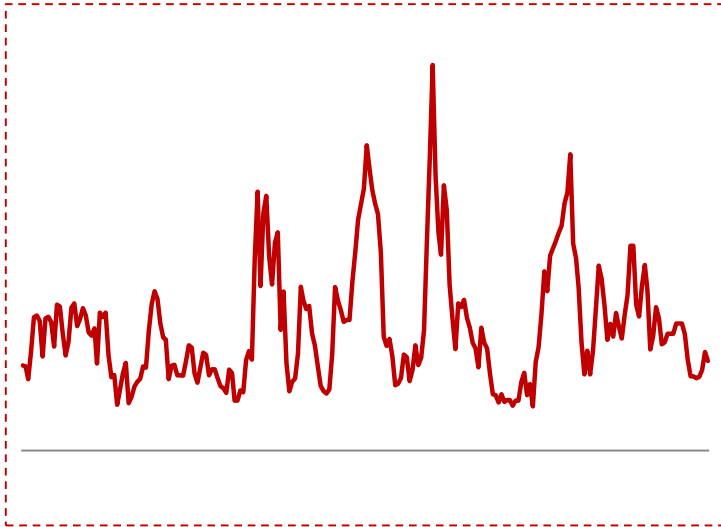


Price Seasonality

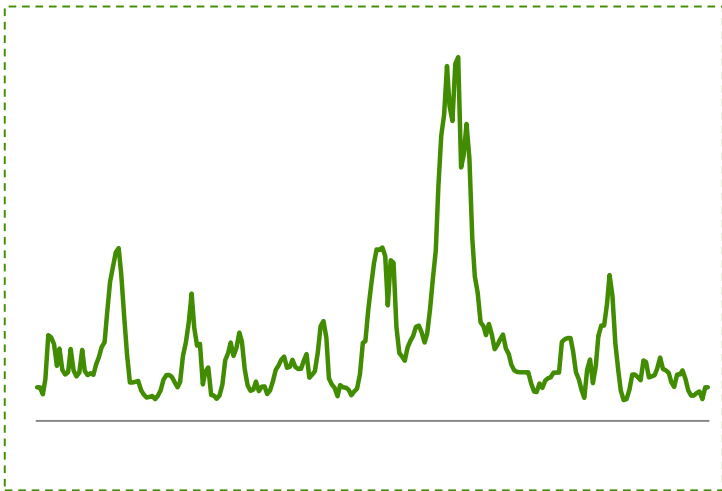
- No clear seasonal pattern for **small chilli**



Price Volatility



- Why is the price of **big red chilli** so volatile?
 - production is very sensitive to input-use and natural conditions; perishability / storability; price elasticity of demand



- Why is the price of **small chilli** much less volatile?
 - More resilient to low input use, less affected by adverse natural conditions

The Experience of the EJ Chilli Association



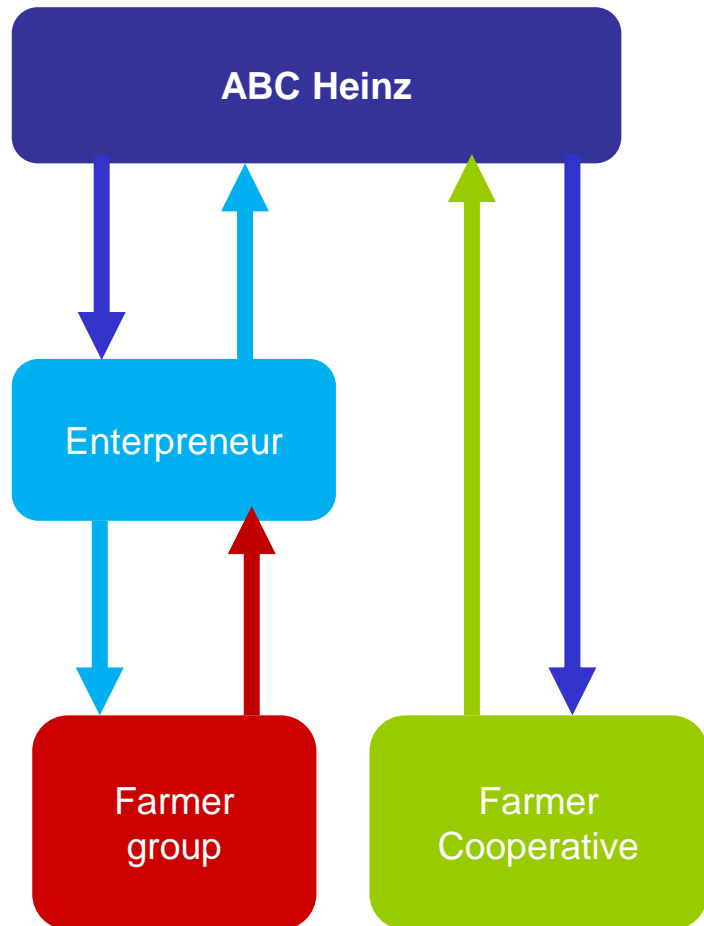
- **Price volatility** is the main concern and area of activity of the Association
- Focus on **big red chilli**: some relevance for Malang, not Sampang
- Non-subsidised **Market Information System** in place
- Objectives of the Association influence the choice of information channels and undermine **outreach**

The Experience of Lead Processing Firms



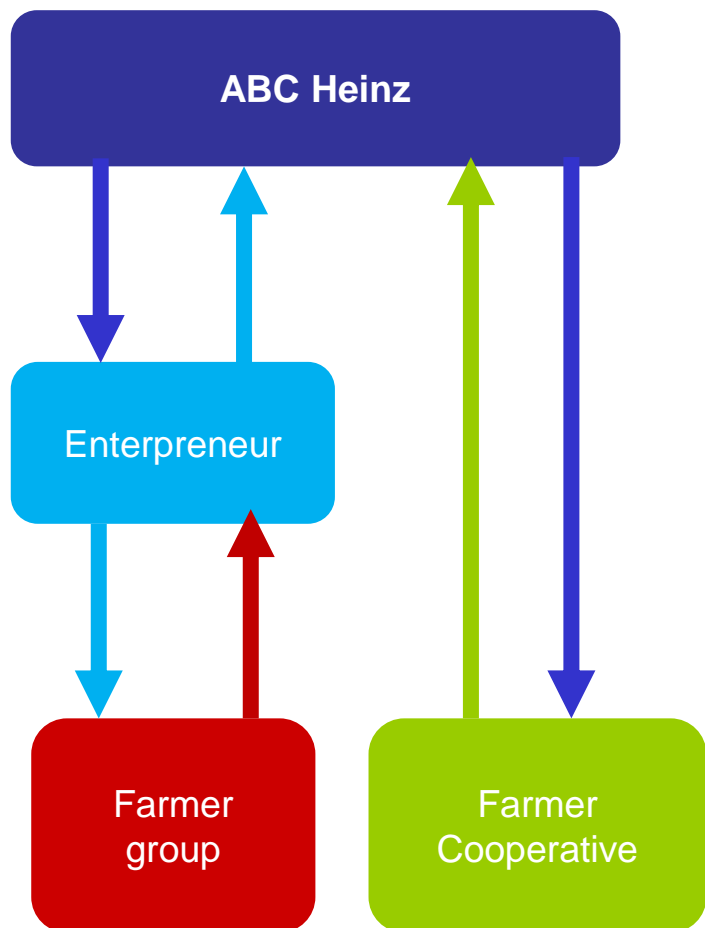
- Large-scale sambal and noodle processors (ABC Heinz, Indo-Food) have **contracting systems** with traders and farmers for **big red chilli**
- For companies and farmers, **contract farming** is a price-hedging strategy (reduce exposure to **price volatility**, stabilise procurement costs)
- For companies, it is also a strategy for access to preferred **varieties**

Contract Farming, ABC Heinz (1)



- Contracts with 1-2 cooperatives (or entrepreneurs linked to farmers) in several East Java districts
- ABC Heinz used to have a contract with a farmer group in Batu; this collapsed in 2010 due to side-selling
- High entry barriers for participation (e.g. cooperatives must be registered as an enterprise and have a bank account)

Contract Farming, ABC Heinz (2)



- Both farmers and processing firms like a **fixed price formula**
- Poor contract design (**pricing formula**) is responsible for poor performance of contract farming schemes in the past
- ABC Heinz has revised its price formula and is investing to consolidate and expand its contract farming scheme

The Malang Chilli Chain



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Chilli Area

- Larger area under big chilli
- Significant inter-annual variations in area

	Big Chilli (ha)			
	2011	2012	Share 2011 %	Share 2012 %
Malang	2,179	1,834	100	100
Poncokosumo	570	676	26	37
Pujon	497	200	23	11
Karangploso	241	260	11	14
Wajak	118	98	5	5
Other	753	596	35	33

	Small Chilli (ha)			
	2011	2012	Share 2011 %	Share 2012 %
Malang	1,459	1,509	100	100
Poncokosumo	174	182	12	12
Pujon	425	342	29	23
Karangploso	101	114	7	8
Wajak	130	248	9	16
Other	629	623	43	41

Chilli Yields

- Lower than national and provincial average yields
- Significant inter-annual variations in yield

	Big Chilli (t/ha)	
	2011	2012
Malang	3.2	3.7
Poncokosumo	6	6
Pujon	3.6	1
Karangploso	1.1	3.4
Wajak	2.3	2.6
Tumpang	1.5	2.9

	Small Chilli (t/ha)	
	2011	2012
Malang	3	2.5
Poncokosumo	5.9	6
Pujon	4	0.9
Karangploso	1.1	2.8
Wajak	2.7	2.7
Tumpang	1.8	2.9

Production Costs ('000 IDR /ha)

- Does curly chilli require more external inputs than big chilli?

	Curly Malang	Curly Malang	Big Malang
Seed	1,300	2,080	1,300
Fertilizer	11,717	13,280	6,260
Pesticides	14,719	29,280	7,503
Hired labour	17,667	14,000	6,675
Other	3,750	2780	3,580
Total cost	49,153	61,348	25,318

Farm Profitability

- Is curly chilli more profitable than big chilli?

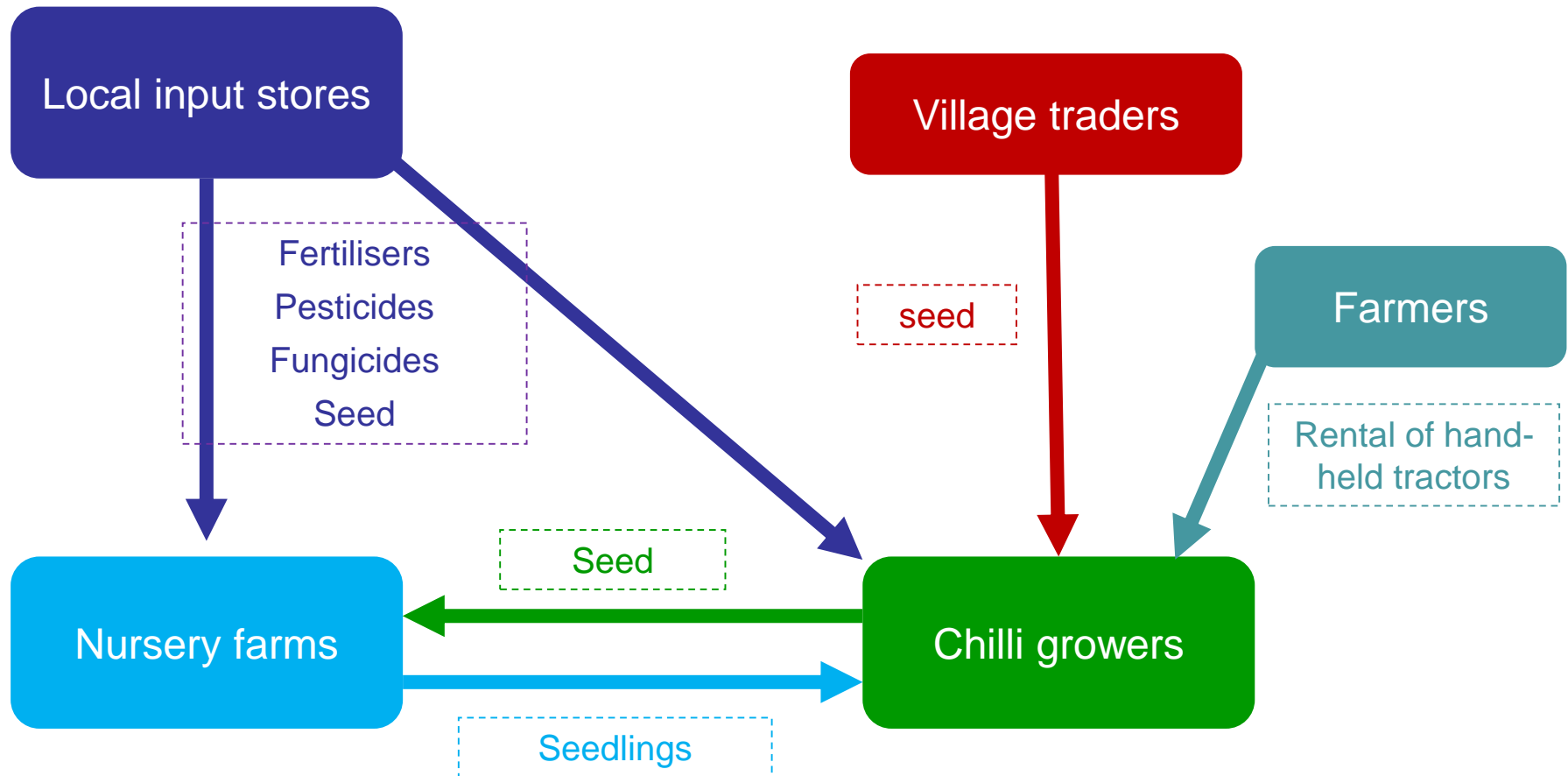
	Curly	Curly	Big
Cost	49,153	61,348	25,318
Revenue ('000 IDR/ha)	140,000	180,000	60,000
Yield (tons/ha)	20	12	10
Price (IDR/kg)	7,000	15,000	6,000
Gross margin ('000 IDR/ha)	90,847	118,652	34,682
Return on family labour (IDR/person-day)	2,096,000	n.a.	518,000

Labour Use

- Significant wage employment impacts

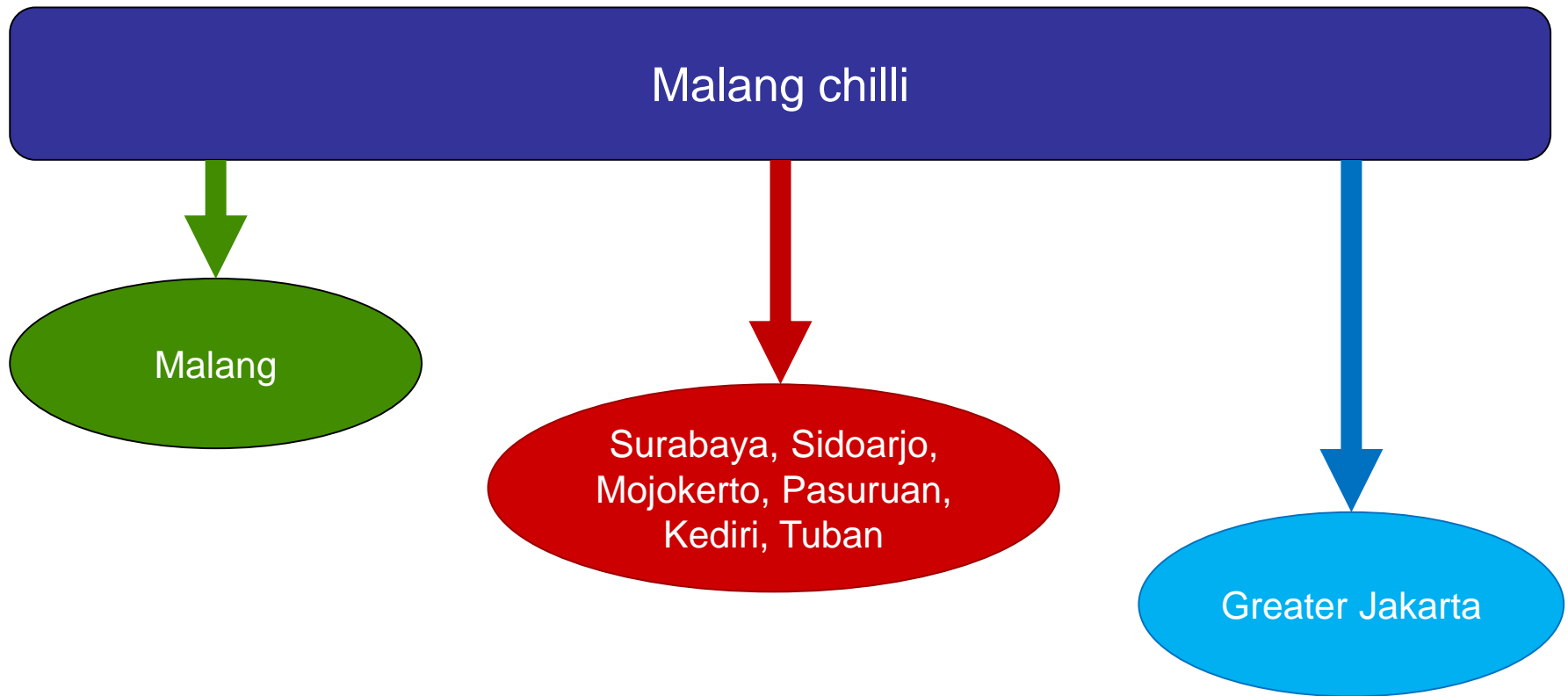
	Curly	Curly	Big	Average
Farm employment (person-days / ha)	307	408	277	331
Hired farm labour / total farm labour (%)	86	100	76	88
Hired female labour / total hired labour (%)	58	67	21	49
Female employment / total employment (%)	50	67	16	44

Local Input Chain

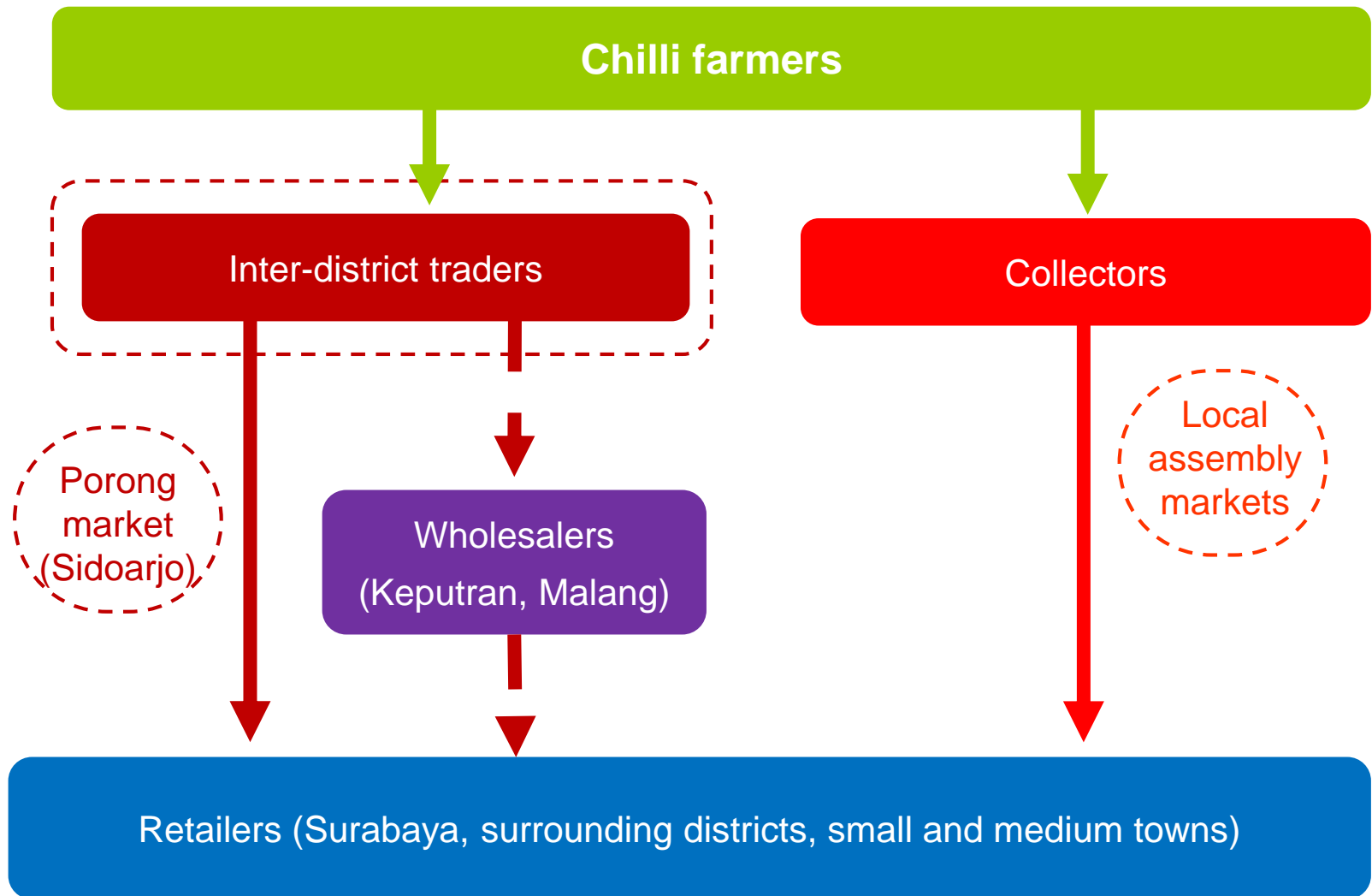


Product Flows

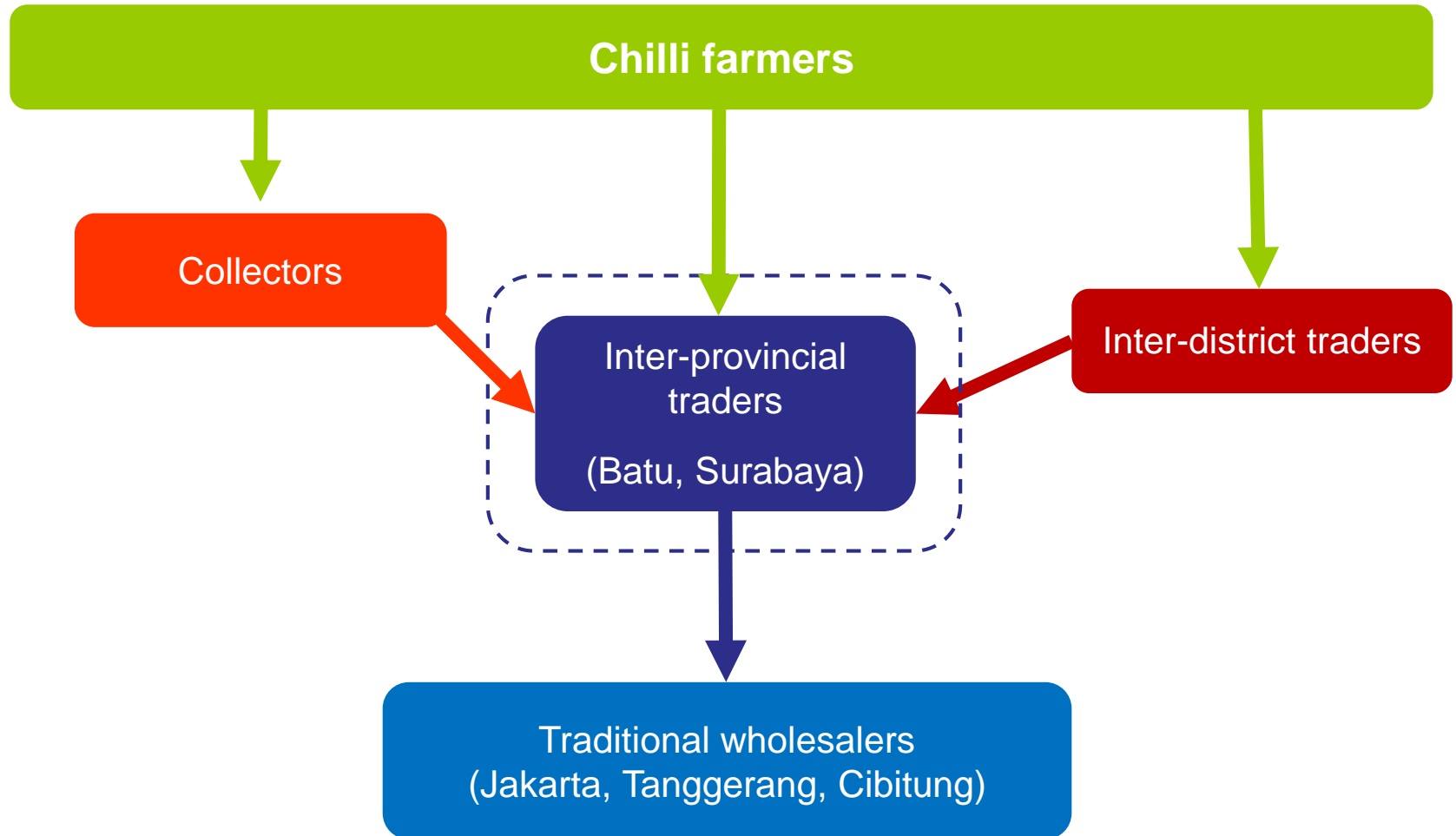
- Most chilli is channelled to markets outside the district
- Jakarta is a strategic market for curly chilli



Intra-Provincial Chain



Inter-Provincial Chain



Trader Profile

	Inter-district	Inter-province
Volumes	0.5 – 1.5 tons/day	4 - 8 tons/day
Product portfolio	Diversified (vegetables)	Specialised (chilli, particularly curly)
Supplying areas	Sub-district neighbouring sub-districts	Malang, other districts
Target markets	District, province	Greater Jakarta
Number of buyers	10-15 regular buyers (mainly large retailers)	One or very few
Trust w/ buyers	Medium	Very high

Coordination and Contracts



- Verbal agreements are the norm
- Network- and trust-based transactions
- No significant examples of **collective action** at the farmer level (but some retailers cooperate w/ each other)
- No examples of **contract farming** were found in the Malang chilli chain

Supermarkets



- The modern retail segment has no expression in the Malang chilli chain
- In Java, supermarkets account for less than 1% of the chilli retail trade

Processing Industry



- The processing sector is large but none of the traders interviewed supplies the processing industry (ABC, Indo-Food) directly
- Some Malang chilli may be channelled to processing companies indirectly (e.g. via Pare)

Margins (Example for Small Chilli)

- The net margins earned by inter-district traders are highly volatile

	Farmer	Inter-district trader Malang	Large retailer Surabaya	Small retailer Sidoarjo
Selling price	45,000 (64% of retail price)	58,000	60,000	70,000
Marketing Cost		45,452	58,755	63,011
Purchasing price		45,000	58,000	60,000
Labour		32	16	0
Packaging		150	110	37
Transportation		164	38	500
Product losses		0	580	2,250
Other		106	11	224
Net Marketing Margin (IDR/kg)		12,548 (21.1)	1,245 (2.1%)	6,989 (10%)

Margins (Example for Curly Chilli)

	Farmer	Inter-district trader Malang	Large retailer Surabaya	Small retailer Sidoarjo
Selling price	17,000 (68% of retail price)	21,000	22,000	25,000
Marketing Cost		17,452	21,755	23,586
Purchasing price		17,000	21,000	22,000
Labour		32	16	0
Packaging		150	110	37
Transportation		164	38	500
Product losses		0	580	825
Other		106	11	224
Net Marketing Margin (IDR/kg)		3,548 (8.3%)	615 (9.9%)	1,414 (9.4%)

Key Problems



1. Losses due to pests and diseases
2. Very volatile prices for big chilli

The Sampang Chilli Chain



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Small Chilli Cultivation in Sampang



- Scattered across many sub-districts
- Kedundung and Tambelang have the largest production areas
- Farm size: 0.5 – 2 ha (average ~ 1 ha)

Seasonality

- Sampang has an early harvest

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sampang												

Harvest

Peak Harvest

Production Costs ('000 IDR /ha)

- Very little investment in chilli farms

	A	B	C	D	E	Average	%
Seed	150	250	500	1,167	800	573	8
Fertilizer	852	852	708	70	1,110	718	10
Pesticides	131	117	58	43	595	189	3
Hired labour	1,700	2,700	7,627	7,373	8,800	5,640	75
Other	600	600	0	280	700	436	6
Total cost	3,433	4,519	8,893	8,933	12,005	7,557	100

Labour Use

- Women account for nearly 2/3 of hired labour
- Daily wage rates are 80-100% higher than in Malang

	A	B	C	D	E	Average
Farm employment (person-days / ha)	74	119	137	212	263	161
Hired farm labour / total farm labour (%)	54	55	78	54	82	65
Hired female labour / total hired labour (%)	75	85	35	77	84	71
Female employment / total employment (%)	55	72	39	49	48	53

Farm profitability ('000 IDR /ha)

- Farmers are earning very little income from chilli; sometimes they may lose or earn no money

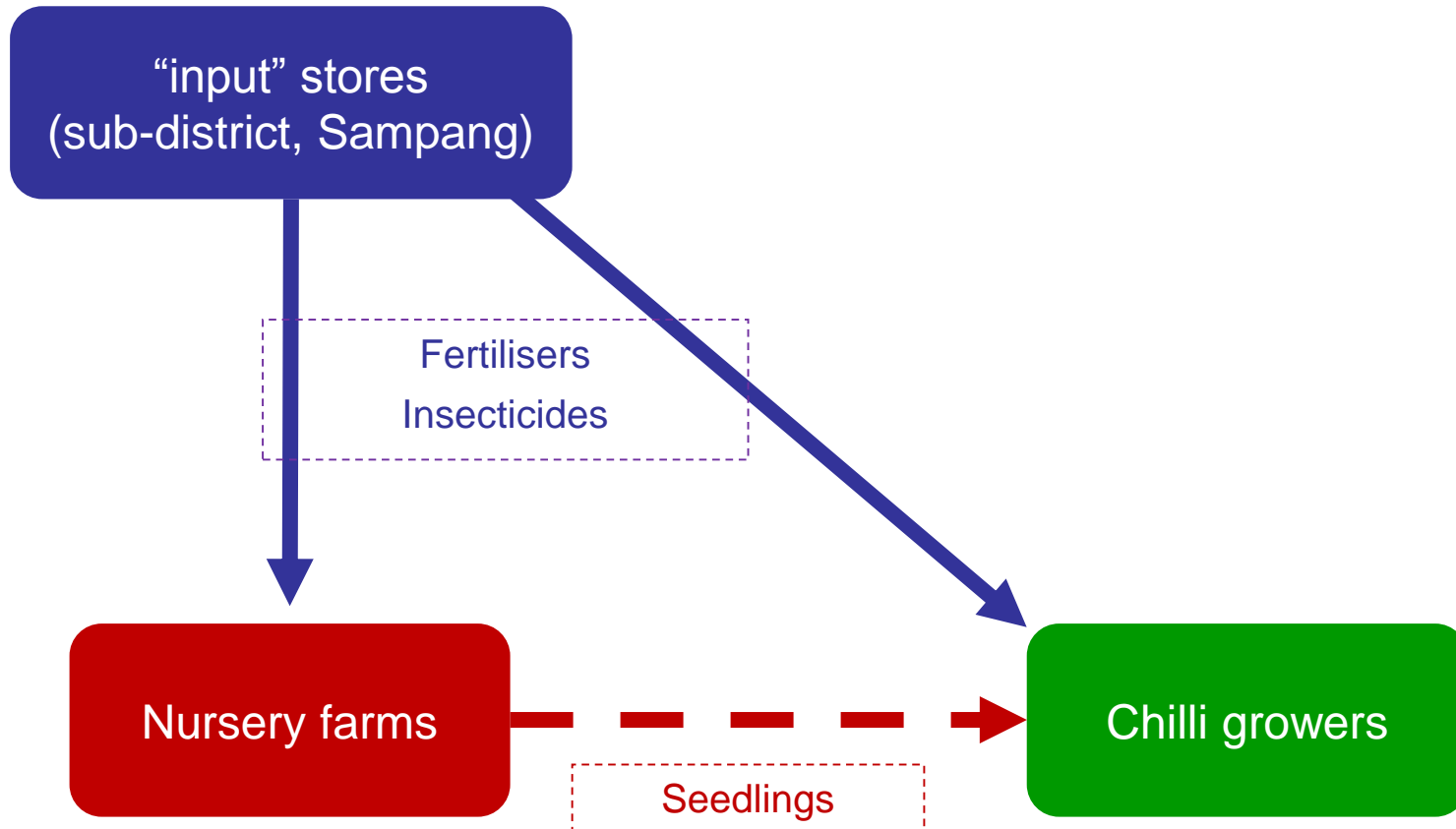
	A	B	C	D	E
Cost	3,433	4,519	8,893	8,933	12,005
Revenue ('000 IDR/ha)	3,200	4,000	9,000	15,000	20,000
Yield (tons/ha)	0.4	0.5	1.2	1	0.8
Price (IDR/kg)	8,000	8,000	7,500	15,000	22,500
Gross margin ('000 IDR/ha)	(233)	(519)	107	6,067	7,995
Return on family labour (IDR/person-day)	(3,478)	(9,611)	3,578	62,123	166,563

Pests and Diseases



- **Diseases:** Gemini Virus, Anthracnose
- **Pests:** Fruit borer

Local Input Chain

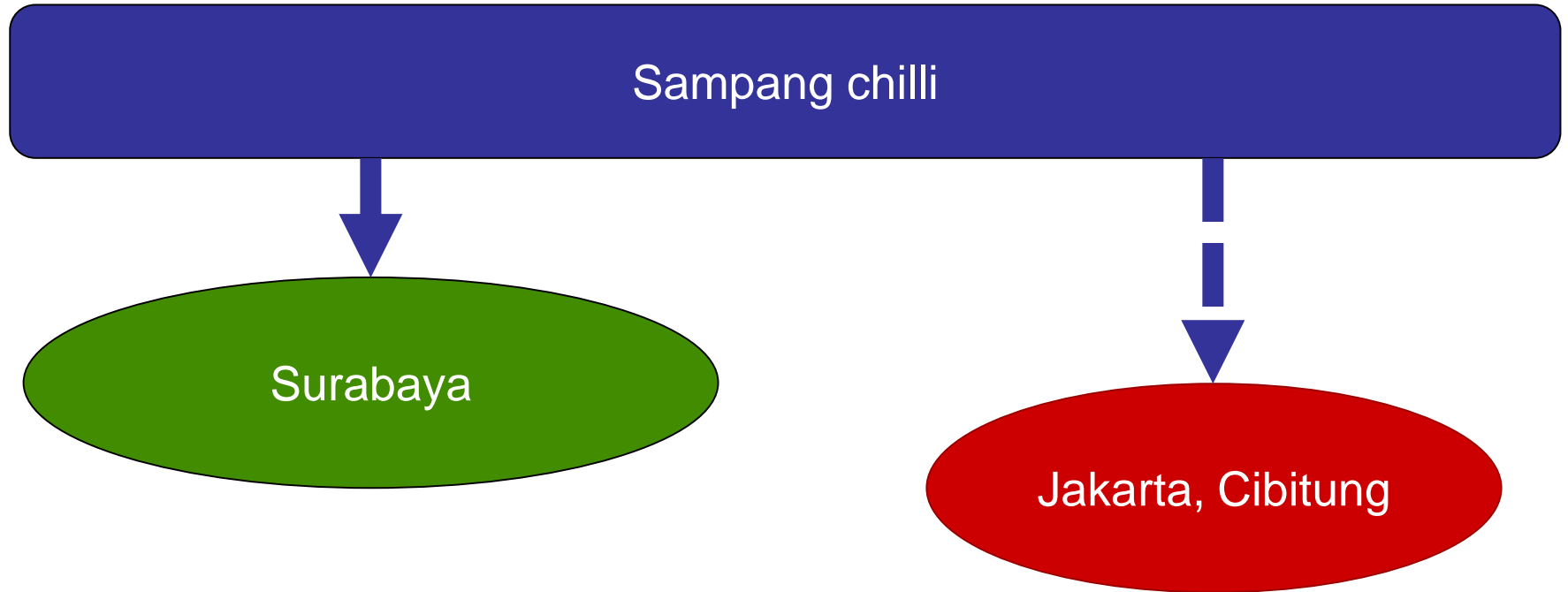


Profile of Nurseries

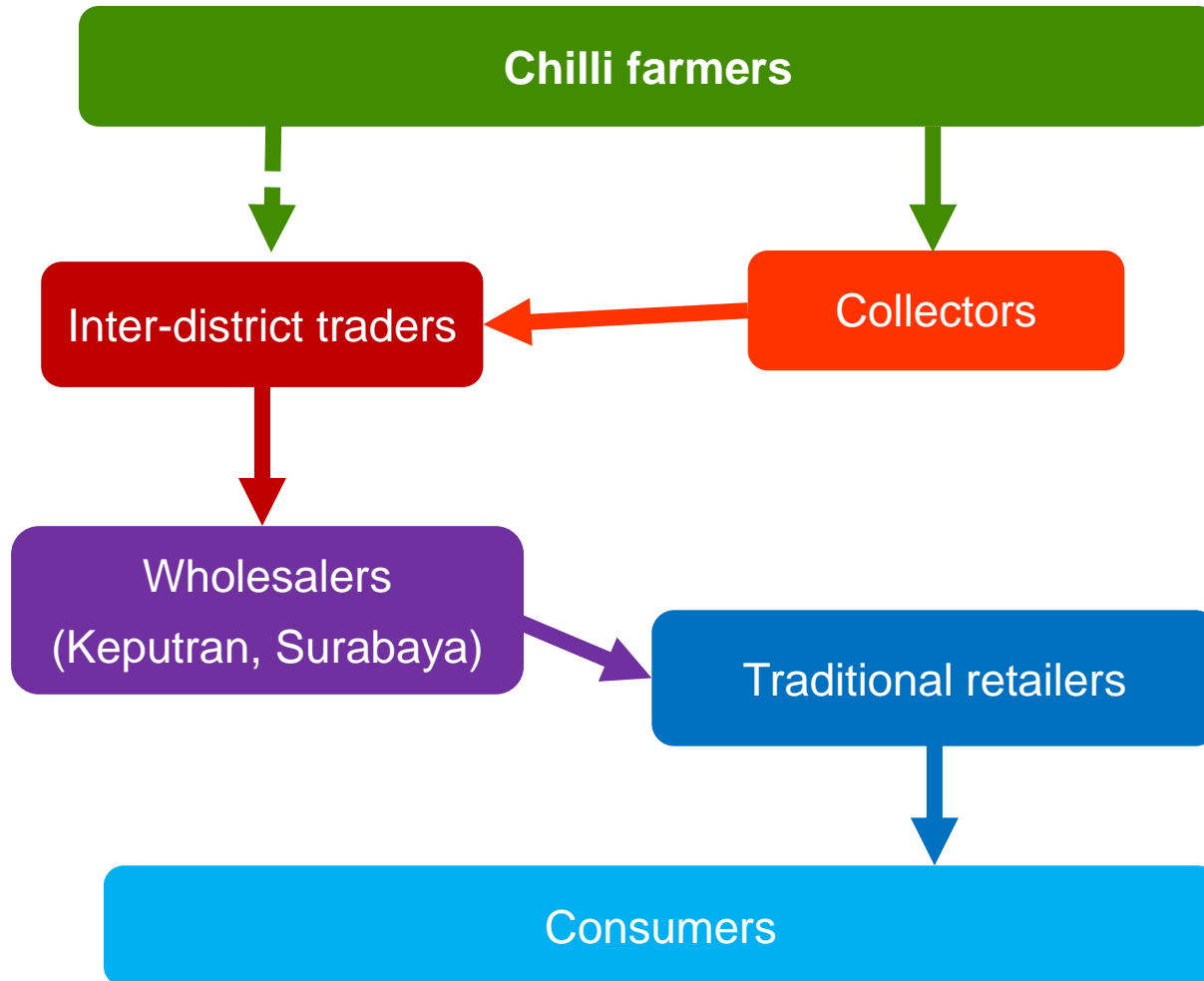
- Sampang and Kediri nurseries; two ends of the spectrum

	Sampang	Pare, Kediri
Product portfolio	chilli	many vegetables
Technologies and practices	OPVs, roof protection (banana leaves), very low chemical use	branded seeds, grenhos, polybags, purchased soil, high chemical use
Labour	own labour	own casual, full-time hired labour
Sources of technical information and advice		seed companies, chemical companies, other nurseries, Dinas...
Production	3 months 20 – 50,000 seedlings / month	9-12 months 200-700,000 seedlings / month
Clients	farmers	farmers, traders, nurseries
Market coverage	village, neighbouring villages	district, other districts

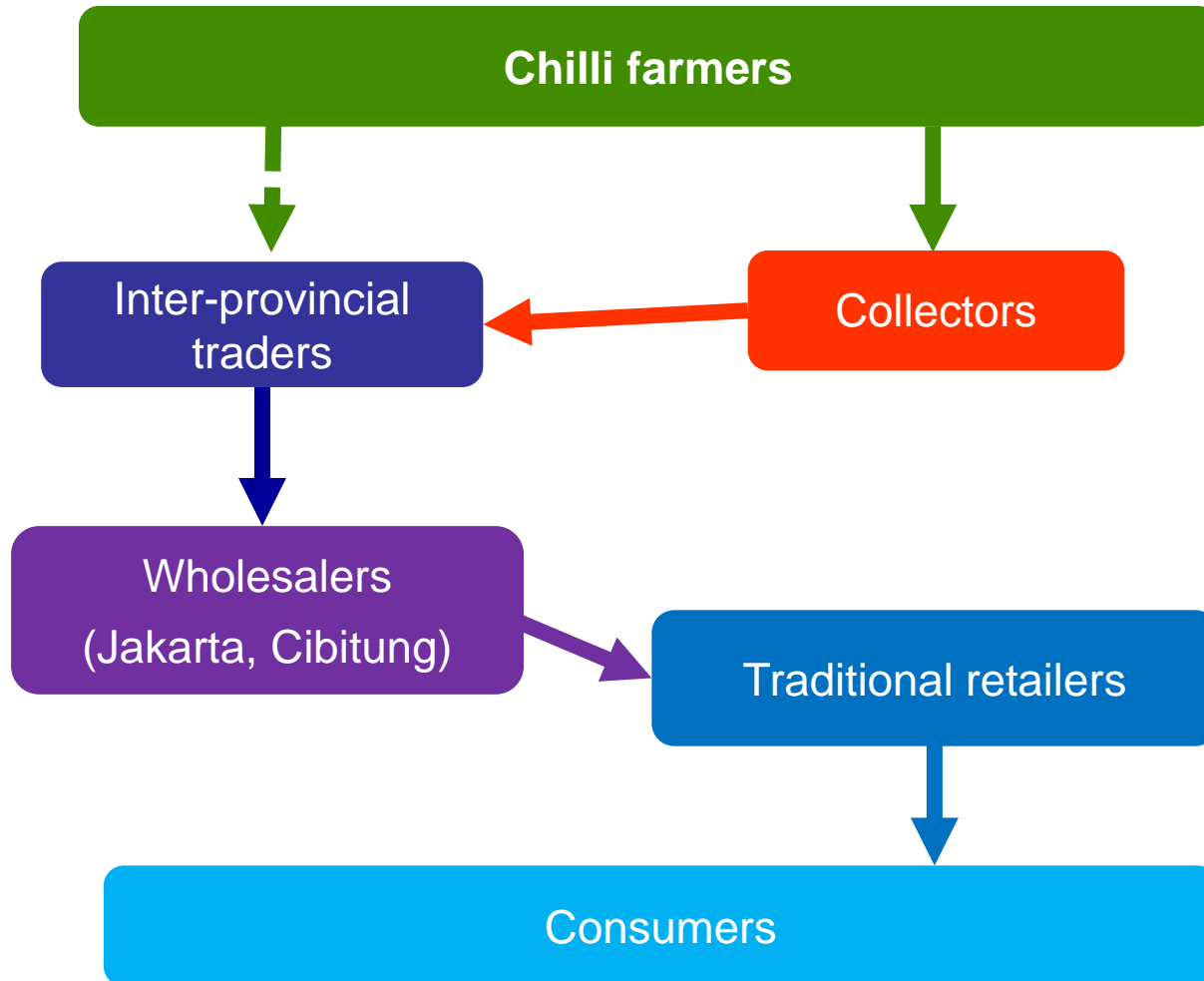
Product Flows



Inter-District Chain



Inter-Province Chain



Knowledge and Credit Flows



- No significant vertical and horizontal flows of technical information and knowledge
- Farmers receive no credit from traders or input retailers
- Traders rely mainly on own capital; some may borrow some funds from pawn shops and the bank

Wholesaler Standards and Quality Management

- Simple product standards and quality management systems

	Grades	Wholesaler requirements	Wholesaler preferences	Quality Management Sampang
Small chilli	No grades	Min. 5 cm no spots, no rots, no stems w/out fruit	Mature clean skin	Assembly trader sorts: fruit w/ rots, stems w/out fruit, and broken chillies are thrown away (Losses: 0.5-4%)

Margins (Example)

- Many intermediaries, low margins (on that day)

15 July	Farmer	Collector Sampang	Assembly trader Sampang	Wholesaler Keputran	Large retailer Surabaya	Small retailer Surabaya
Selling price	9,500 (64% of retail price)	10,000	11,000	12,000	13,000	17,000
Marketing Cost		9,540	10,535	12,550	12,531	14,
Purchasing price		9,500	10,000	11,000	12,000	14,720
Labour		0	110	100	350	0
Packaging		0	20	20	37	37
Transportation		40	505	5	37	500
Product losses		0	0	360	75	1,083
Other		0	0	65	32	100
Net Marketing Margin (IDR/kg)		460 (4.6%)	365 (3.3%)	450 (3.8%)	469 (3.6%)	2,280 (13.4%)

Presentation of Key Interventions - Chilli



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Key Interventions: Malang Big Chilli Value Chain



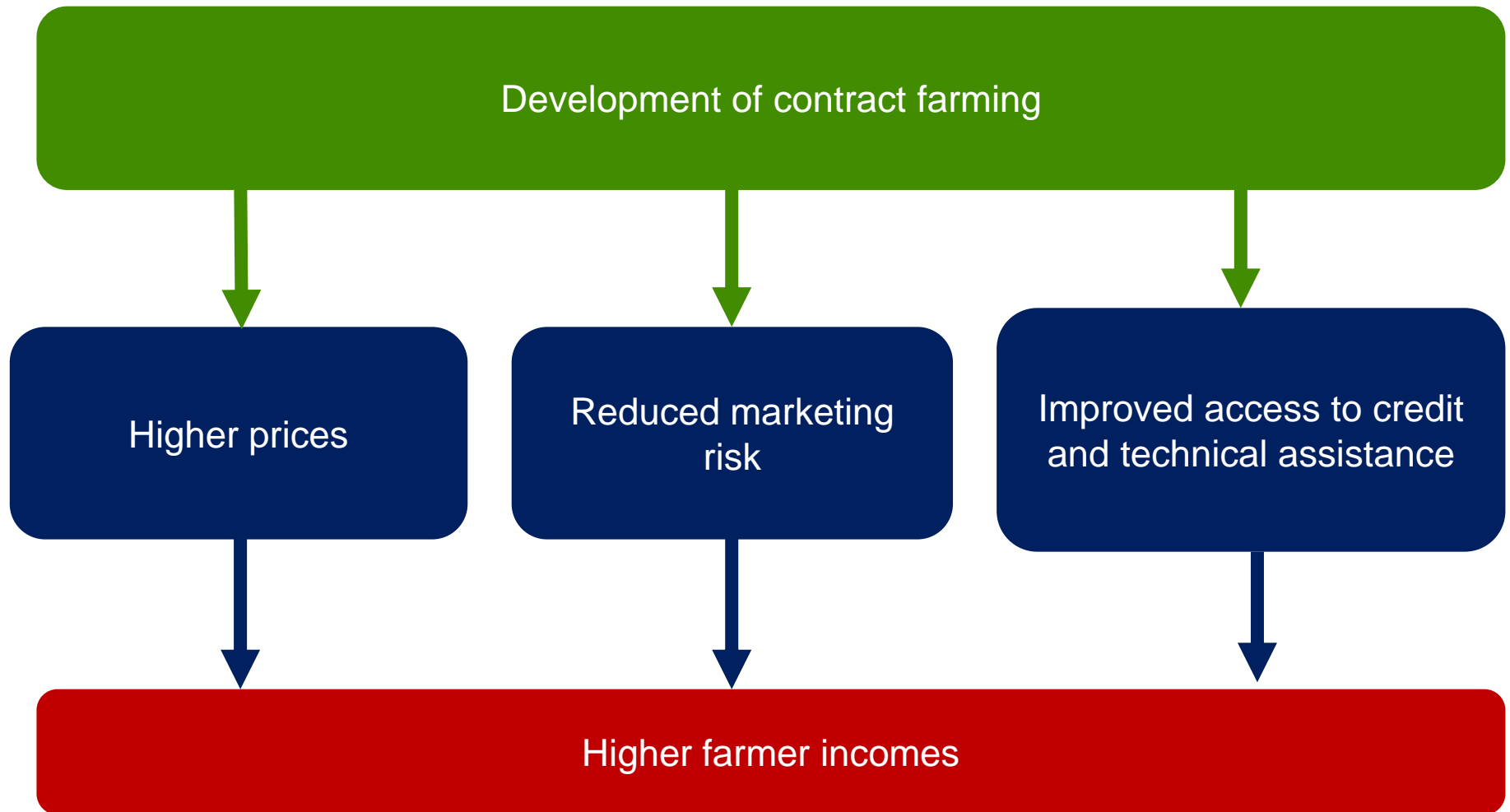
1. Development of local contract production for the processing industry

1. Contract Farming



- Support an expansion of ABC Heinz contract farming scheme to Malang
- Test ABC Heinz preferred big chilli varieties on farm with seed companies and 2-3 largest chilli traders in Malang
- If financially profitable, work with these traders and ABC Heinz to develop a contractual relationship
- Scale-out the intervention to Batu
- **Timeframe: 2 years**

Potential Impacts

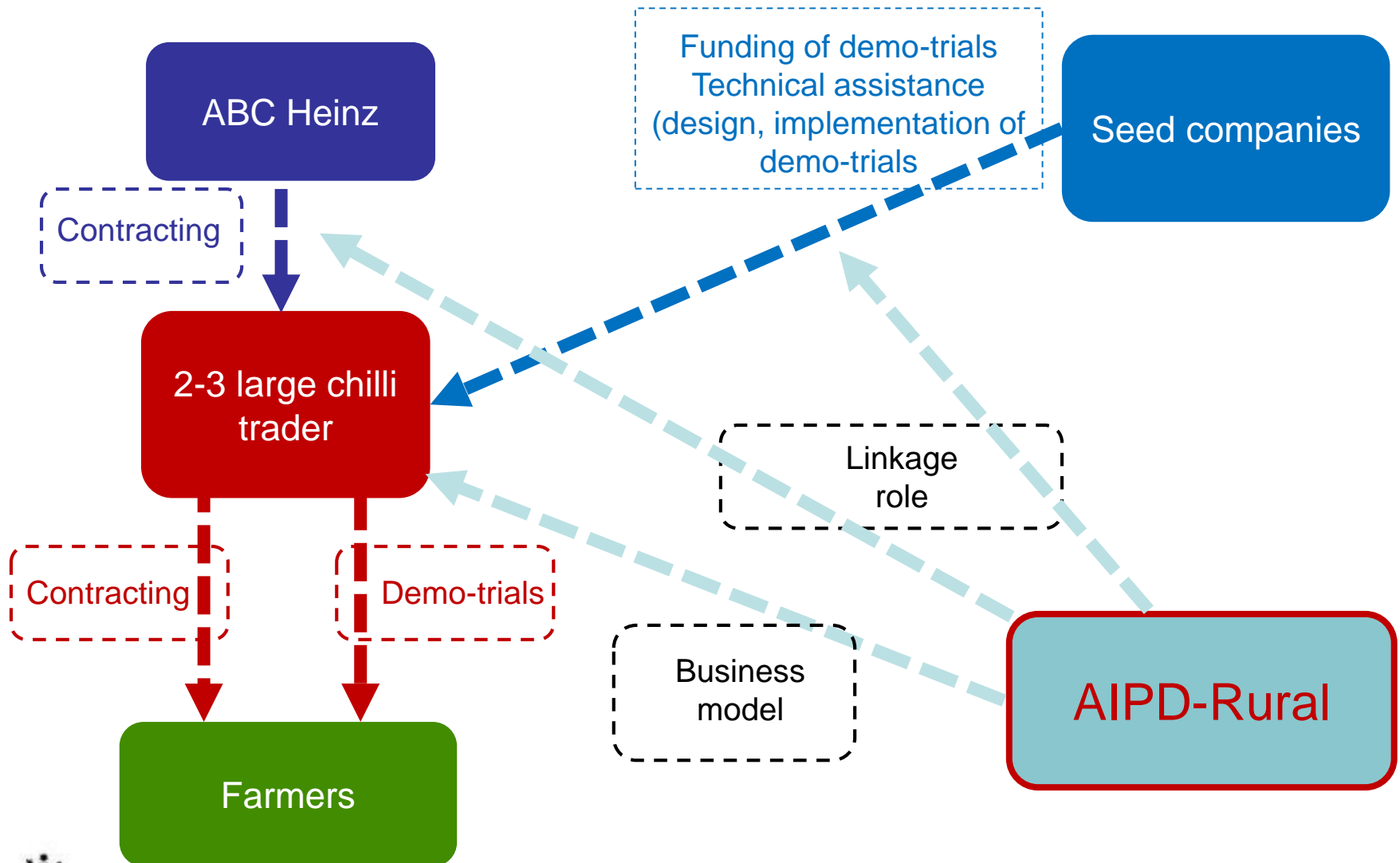


Risks / Weaknesses



- Limited outreach (i.e. scale and replication)?
- Indirect, pro-poor employment impacts but no direct pro-poor impacts

Potential Solution Providers



Key Interventions: East Java Big Chilli Value Chain



2. Development of cold storage systems
3. Improvement of the performance of an existing chilli market information system

2. Cold Storage Systems



- Evaluate the technical market and financial feasibility of cold storage for chilli
- If feasible, co-fund private sector investment in cold storage facilities by large traders in Kediri
- **Timeframe: 2 years**

Potential Impacts

Storage of chilli during periods of low market prices
by traders in strategic market locations



Increase in market prices at the low end;
reduction of market prices at the upper end



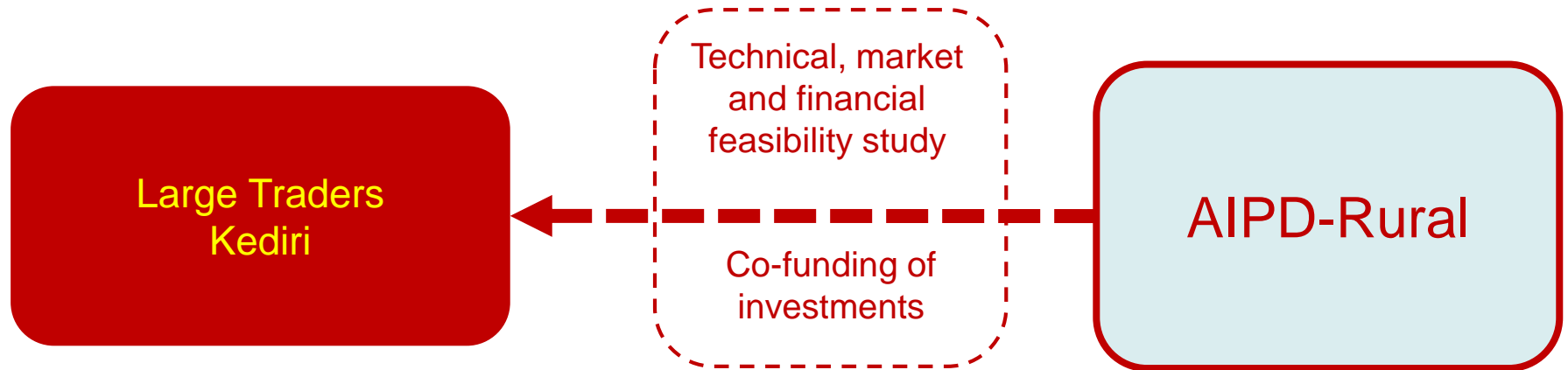
Reduction of marketing risk,
stabilisation of farm profits

Risks / Weaknesses



- Is investment in cold storage profitable?
- Cold storage systems have to be developed at some scale for systemic price impacts (crowding-in)
- But large numbers of big chilli growers in Malang and other districts can benefit (leveraged impacts)

Potential Solution Providers



3. Chilli Market Outlook Services



- Work with the EJ Chilli Association to improve the design of their current MIS
- Develop the technical capacity of the association to conduct short-term market outlook analysis
- Develop cost-effective information dissemination channels for outreach
- **Timeframe:** 2 years

Potential Impacts

Market outlook services

Ability to “anticipate” future market dynamics

Better planting decisions by farmers

Higher farm profits

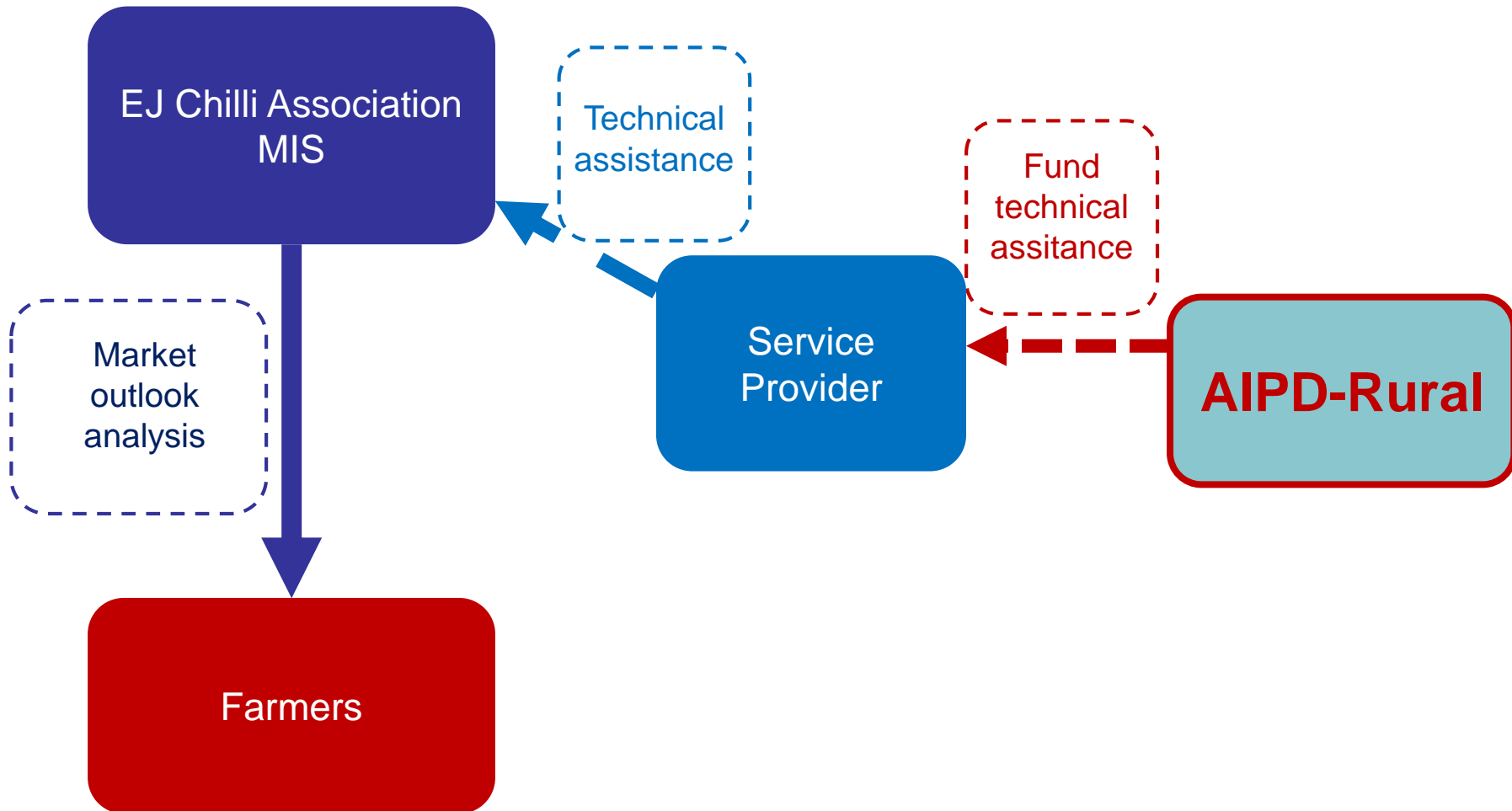


Risks / Weaknesses



- Does the East Java Chilli Association see MIS as a public good or as a “closed” service for members?
- Who is the right service provider?

Potential Solution Providers



Key Interventions: Sampang Small Chilli Value Chain



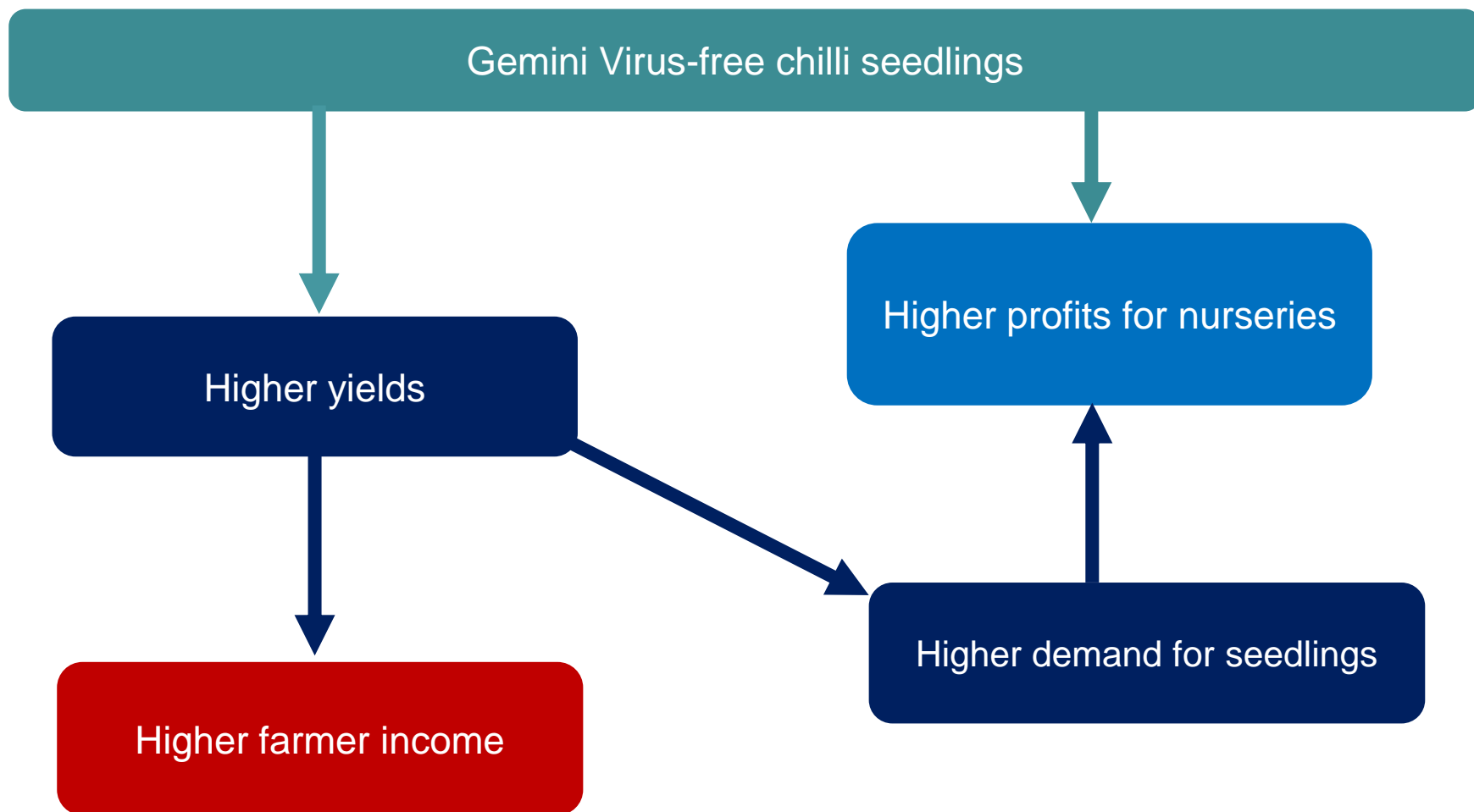
4. Upgrading of local nursery businesses to improve seedling quality and address Gemini Virus problems

4. Upgrading Seedling Quality



- Transfer of relevant know-how to 'larger' nurseries
BPTP? Nurseries in Kediri?
- Promotion of local demand for higher quality, Gemini Virus-free seedlings
- **Timeframe:** 3/4 years

Potential Impacts

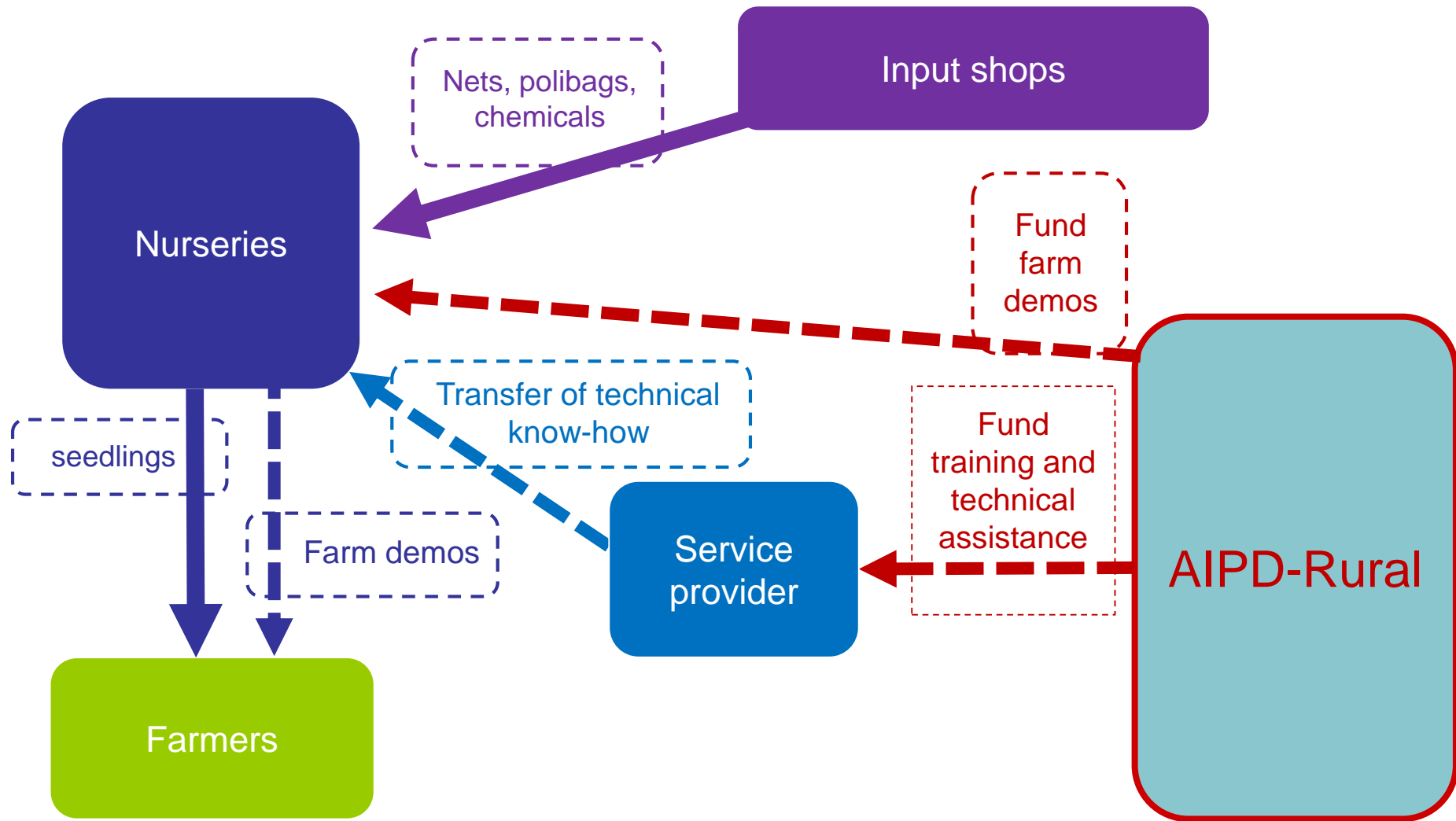


Risks / Weaknesses



- No service providers able or interested to provide technical advisory services to small nurseries in Sampang.
- Are nurseries willing to invest in the production of quality seedlings?
- Are farmers willing to pay for quality seedlings?

Potential Solution Providers



Research Gaps



- Intra-district and inter-annual yield variations in Malang
- Simple and profitable innovations in chilli production in Sampang
- Export development opportunities and constraints
- Lead firms in premium markets (export, organic, safe, supermarkets)
 - Business models
 - Contract farming
 - Collective action
 - Scalability

Summary of Key Interventions: Chilli Value Chain



Malang Big Chilli

1. Development of local contract production for the processing industry

East Java Big Chilli

2. Development of cold storage systems
3. Improvement of the performance of an existing chilli market information system

Sampang Small Chilli

4. Upgrading of local nursery businesses to improve seedling quality and address Gemini Virus problems