INCATA: Linked Farms and Enterprises for Inclusive Agricultural Transformation in Africa and Asia

INCATA Project: Preliminary results from Odisha, India

Work performed by IFPRI, Michigan State University, Tegemeo Institute and RIMISP.

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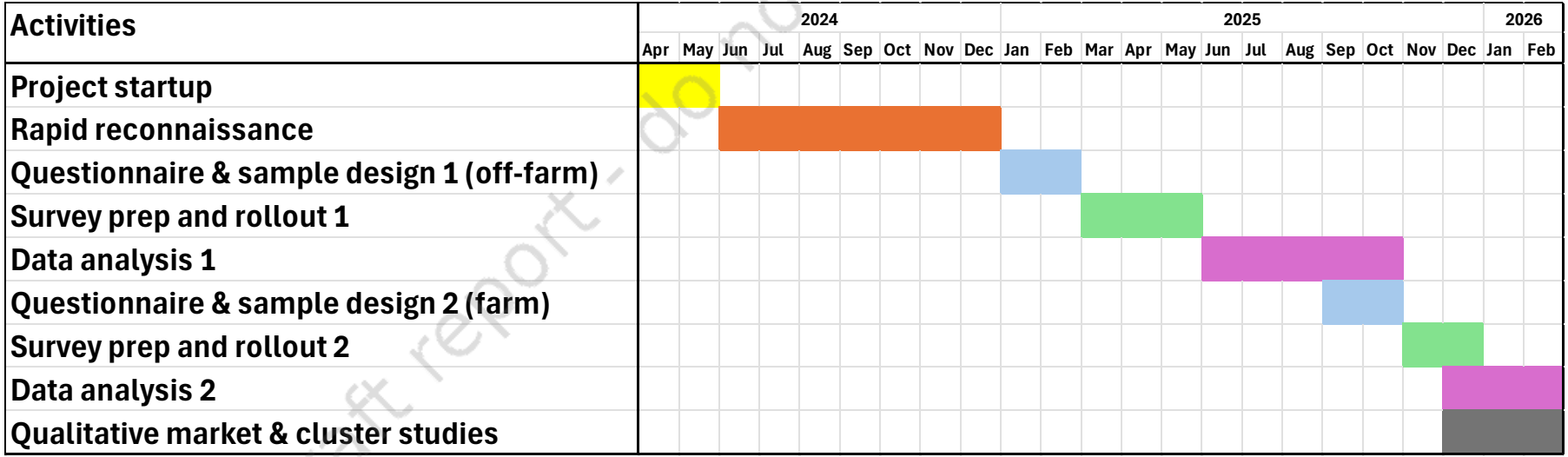
RIMISP
Centro Latinoamericano para el Desarrollo Rural

PPT Deck prepared by IFPRI

Introduction

Working with: MICHIGAN STATE UNIVERSITY · EGERTON UNIVERSITY · IFPRI

Timeline of INCATA project activities in Odisha



Rapid reconnaissance activities

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Visited 19 out of 30 districts in 4 rounds of fieldwork, covering:

- Coastal plains
- Northern uplands
- Southern uplands

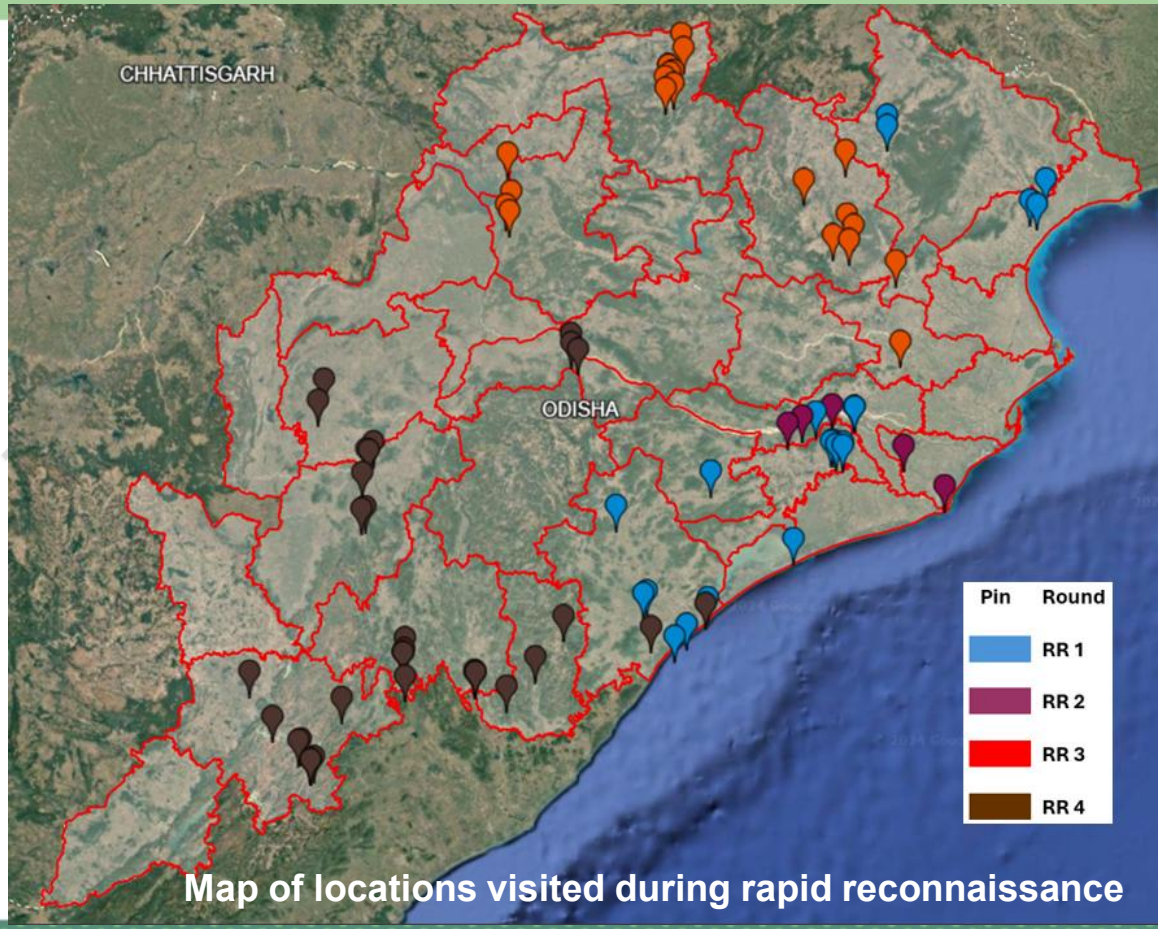
Areas visited included:

- Most agroecological zones
- Tribal and non-tribal communities
- More and less economically developed areas

178 semi-structured interviews with vegetable value chain actors to understand the 'lay of the land'

35 markets visited

Obtained & analyzed supporting secondary data (mostly Govt. of Odisha)



Map of locations visited during rapid reconnaissance

Rapid reconnaissance activities

Working with: MICHIGAN STATE UNIVERSITY, EGERTON UNIVERSITY, IFPRI

Actor	Vegetables	Aquaculture	Total	%
Input supplier	16	6	23	11
Farmer	42	5	47	21
Wholesaler	25	7	32	15
Retailer	45	13	58	26
Transporter	9	0	9	4
Government	24	5	29	13
NGO	11	2	13	6
Others	5	3	8	4
Total	178	41	**219**	100
%	81	19	100	-

Rapid reconnaissance interviews by value chain and actor type

Actor	Scale	Vegetables	Aquaculture
Input supplier	Small	5	3
	Large	12	3
Farmer	Small	34	5
	Large	8	0
Wholesaler	Small	5	1
	Large	20	6
Retailer	Small	45	13
	Large	0	0

Rapid reconnaissance interviews by, value chain, actor type and scale

Aquaculture rapid reconnaissance

- Fish in Odisha is mainly sold & consumed 3 days per week due to religious customs = limited demand/consumption.
- Vast majority of farmed fish in Odisha 'imported' from neighboring Andhra Pradesh. Value chain of fish from Andhra Pradesh (AP) extremely well developed. Fish from AP cheaper than fish from Odisha.
- No dense spontaneous clusters of commercial freshwater fish farms and linked MSMEs producing for the domestic market exist (unlike in neighboring states of AP and West Bengal)
- Fish aquaculture thinly spread across large numbers of individual ponds, often supported by government promotional efforts (e.g., Self Help Groups, NREGA, PMMSY)
- Locally produced farmed fish from scattered village tanks and backyard aquaculture ponds enter the market in limited quantities: fish farming is primarily a subsistence activity
- Numerous very large clusters of commercial shrimp ponds throughout the coastal belt
- Shrimp farmers have high dependency on input suppliers for feed and chemical in-kind credit, and wholesalers for tied output-credit.
- But shrimp is a high value, capital-intensive export crop, so out of scope for INCATA
- These findings led to decision to focus on vegetable value chain, as far more prominent than aquaculture

Rapid reconnaissance findings (1)

Vegetable commercialization driven by irrigation + hybrid seed + mobility + markets

- Commercial vegetable production established for 30-40 years, but expanding where access to irrigation + slightly elevated land
- Mix of public (e.g., lift) and private (e.g., borewell) irrigation; increases the number of seasons in which veg can be cultivated, from 1 to 2 or 3
- Farmers attracted to commercial veg cultivation by high returns relative to paddy.
- Expansion of veg area via conversion of fallow, traditional grains, forest, upland paddy
- Hybrid seed has increased veg productivity. Most seed veg is hybrid. Hybrid seed often adopted as package with fertilizer + agrochemicals
- Proliferation of roads + transport services + communications + markets has increased mobility and made it easier to sell and buy veg
- Land rental markets have deepened, allowing entry into/expansion of veg cultivation by previously landless or marginal farmers

Rapid reconnaissance findings (2)

Value chain development spurred by mix of public and private activity

- Government & NGO efforts (APCs) have promoted vegetable farming clusters in historically marginalized areas, by providing training, support for marketing & crowding in public investments
- Growth of input shops that provide advice to farmers (e.g., what seeds to use, which chemicals to treat)
- Nurseries emerging in some places (NGO supported and private)
- In Sundarghar, emerging adoption of grafted tomato seedlings (from Chhattisgarh) + drip irrigation + plastic mulch. 3X higher investment; 4X higher return. Promoted by large private farmer-traders under quasi-contract farming arrangements.

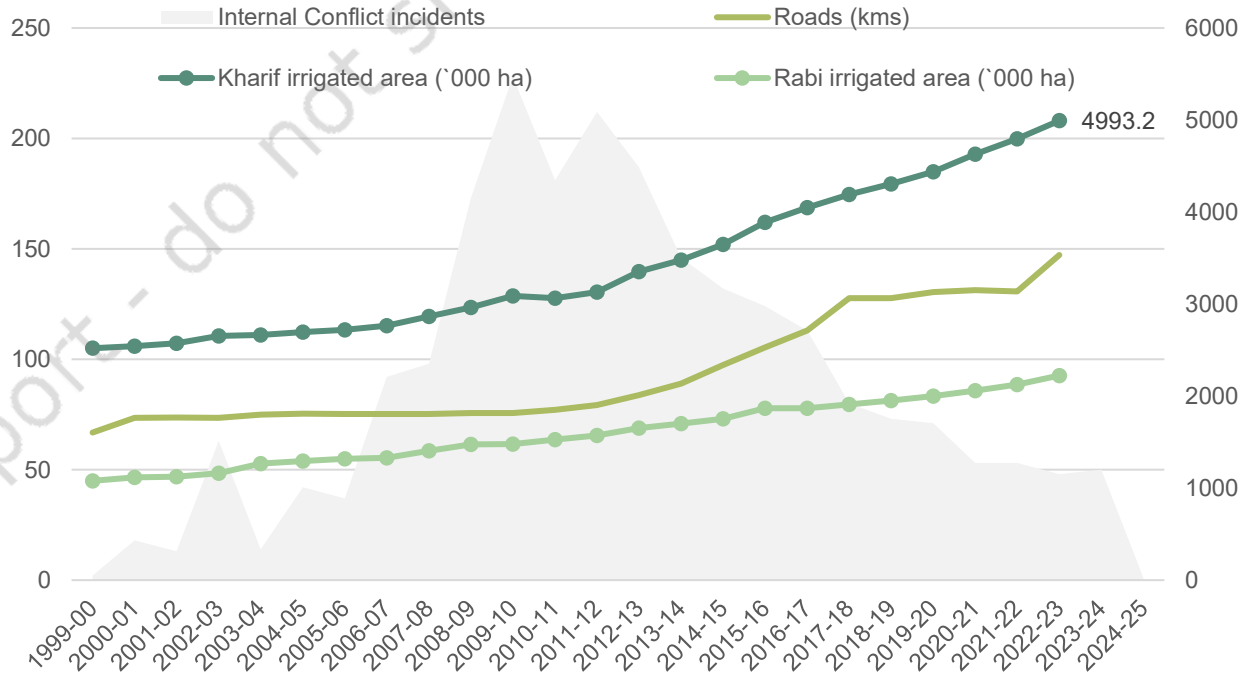
Rapid reconnaissance findings (3)

Policies and institutions influencing the development of markets

- Odisha has had few restrictive marketing policies historically
- New private markets established following ‘denotification’ of vegetables
- Retailers numbers have grown rapidly with supply of veg, and include many women (low barriers to entry)
- Women more involved in veg farming and marketing in tribal districts than coastal belt
- Gender division of labor in tribal areas enables ‘farmer-trading’: women often sell at market in morning while men tend the farm

Rapid reconnaissance: Secondary data

Expansion of roads, irrigation, following resolution of internal conflict in 2010



Rapid reconnaissance: Secondary data

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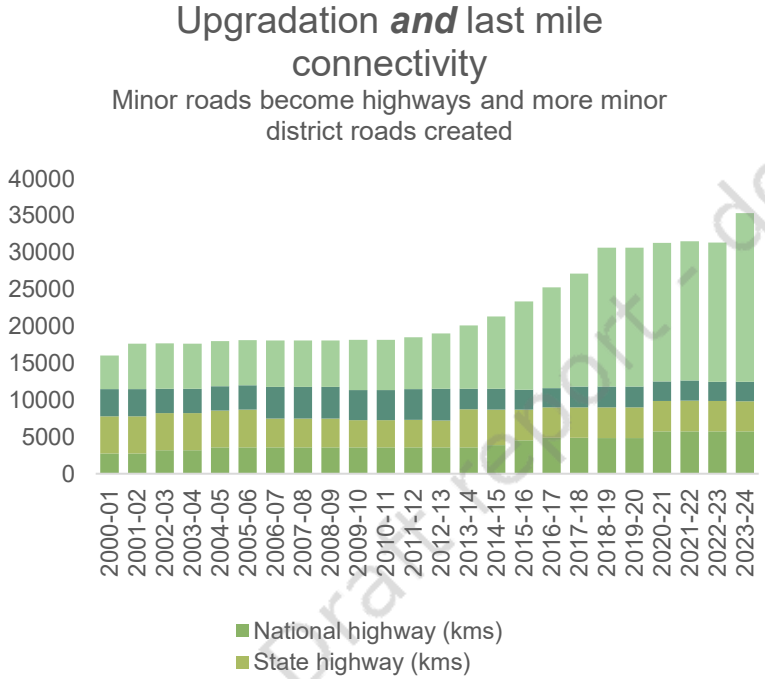
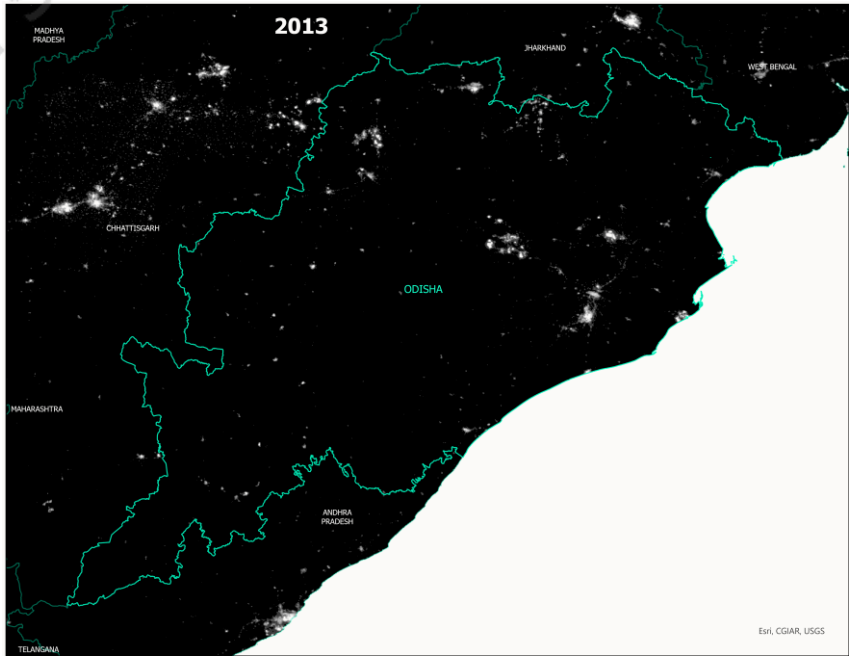
Road expansion: growth in last mile connectivity & upgrading to highways; Increasing electricity consumption with urbanization, new urban growth centers



Road network in 2010 & 2024



Nighttime lights

Rapid reconnaissance: Secondary data

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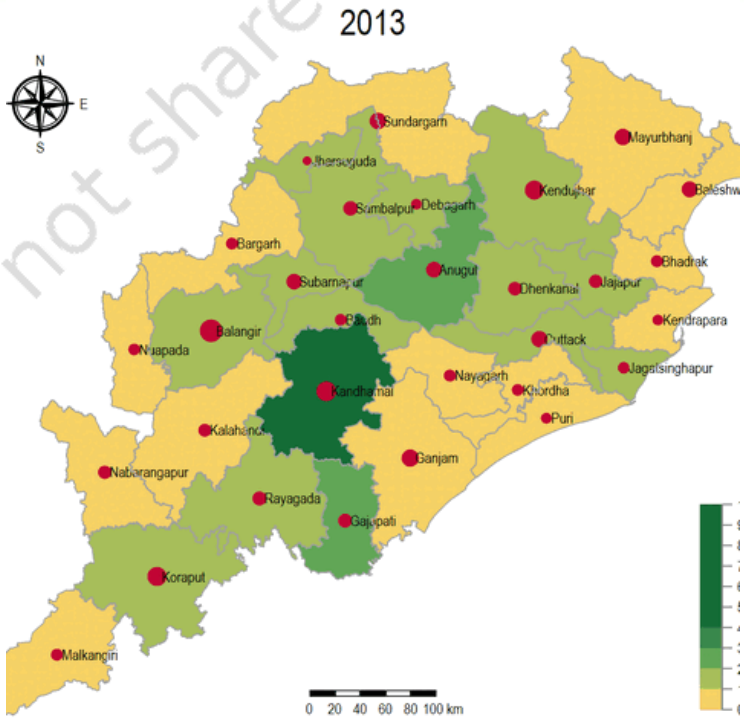
Spatial specialization of vegetable cultivation:

Concentration in districts in central spine

De-concentration in vicinity of urban growth centers and border districts



Vegetable production Spatial concentration index:
(Source: unpublished Department of Horticulture Statistics)

Rapid reconnaissance findings (8)

Preliminary Conclusions from Rapid Reconnaissance

- Odisha's vegetable value chains are developing in response to a mix of demand, and public and private investments, contributing to agricultural transformation
- MSMEs upstream and downstream of the farm (e.g., input suppliers, wholesalers, retailers, transporters) have emerged spontaneously, facilitating commercial vegetable farming and creating many livelihood opportunities
- Efforts to establish producer clusters in tribal areas have helped to accelerate and deepen commercialization
- Most technologies are intermediate. More sophisticated tech such as drip irrigation and grafted seedlings just beginning to emerge, so much scope for production increases and more specialized off-farm MSMEs in future
- Irrigation has been a critical supply side factor facilitating growth of commercial veg cultivation
- Severe water stress is apparent at some places/times, and loss of access to irrigation has caused veg production to shrink in some places

Rapid reconnaissance findings (8)

Preliminary Conclusions from Rapid Reconnaissance

- Farm clusters emerged along the course of rivers/close to dams giving irrigation access.
- Markets/market clusters have been established along the roads, especially at junctions and in towns, and in the vicinity of veg clusters (markets arise to serve veg clusters, and maybe vice versa).
- Non-APC (i.e. spontaneous) veg farm clusters are found in both coastal lowlands and interior.
- APC veg farm clusters mainly in remoter, historically less developed interior areas with tribal communities and previous history of Naxalism.
- APCs formed by deliberate attempts to establish veg commercial cultivation where there was none before, but sometimes piggybacking on existing spontaneous veg development (mixed APC/non-APC clusters; attracting in traders).
- Growing cities in coastal plain (e.g. Bhubaneshwar) and NE mining belt (e.g., Rourkela, Sambalpur) are poles that that draw in veg from surrounding districts and bordering states, for redistribution within Odisha.

Rapid reconnaissance findings (9)

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Research questions arising from rapid reconnaissance (to be tested with stacked surveys)

- What drives the spatial and temporal diffusion of commercial vegetable farms and linked MSMEs
- Who (in terms of gender, caste, age) derives benefit from commercial vegetable value chains, who is excluded?
- How does the performance of spontaneous and organized vegetable clusters differ?
- How, and to what extent does clustering lower entry barriers and transaction costs for cSSPs?
- How do public and private forms of market governance impact the performance of marketplaces and the actors transacting in them?
- How does participation in vegetable value chains reshape gender and caste norms?

Complete summary of survey samples

Survey node	Sample size
Market	**163**
Vegetable trader	**1623**
Wholesaler	*384*
Retailer	*1239*
Input supplier	**628**
Farmer	**3200**
Vegetable (non-APC)	*2160*
*Vegetable (APC)**	*300*
Rice	*864*
Community	**145**
Total	**5759**

Note: *APC = Farmer is member of an organized Agricultural Production Cluster

Market type	Sample size
Vegetable only	**46**
Fish only	**5**
Mixed vegetable & fish	**112**
Any vegetable	**158**
Any fish	**117**
Vegetable wholesale only	**10**
Vegetable retail only	**14**
Vegetable mixed wholesale & retail	**134**
Total	**163**

Survey sample design, phase 1

Working with: RIMISP, Michigan State University, Egerton University, IFPRI – International Food Policy Research Institute

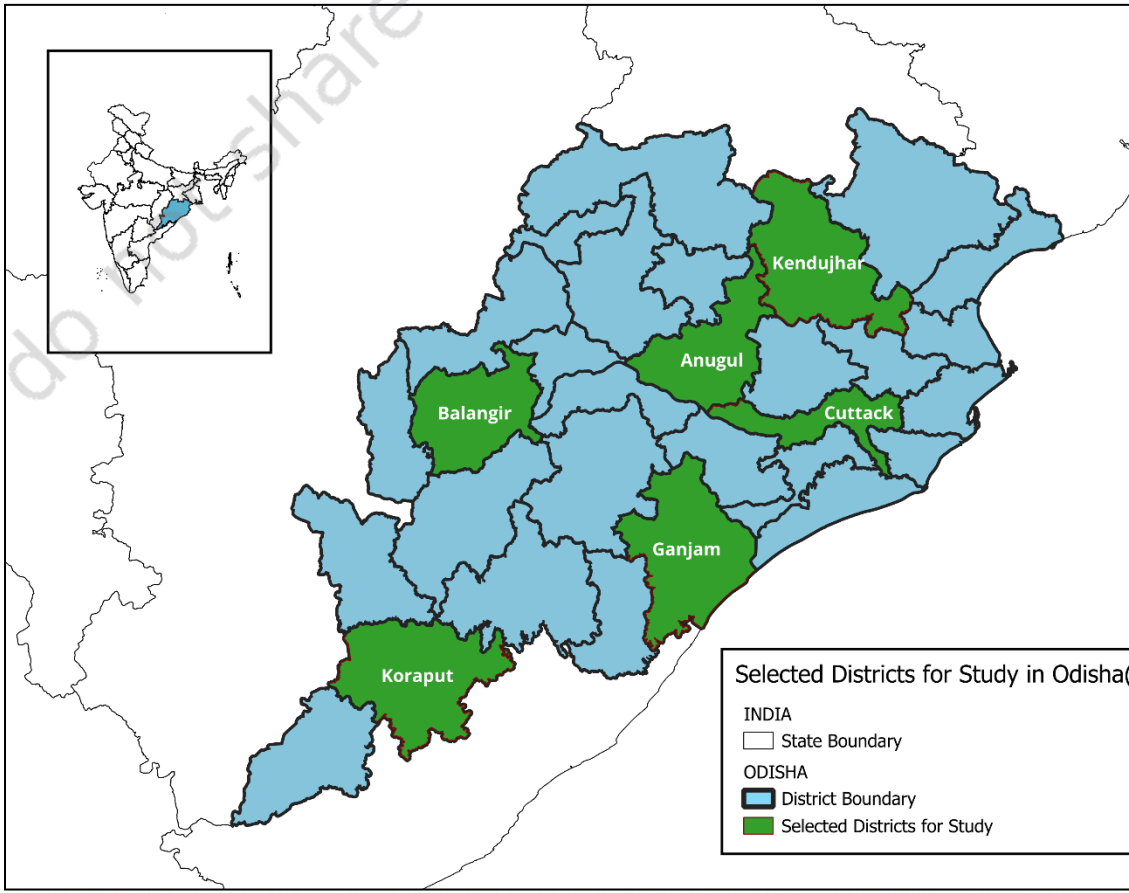
Step 1: Selection of 6 districts based on contrasting socioeconomic & agroecological characteristics, rate of growth & concentration of veg farming, interest from policymakers.

Step 2: Stratified random selection of 4 blocks per district (2 high veg, 1 medium veg, 1 low veg) – designation based on discussions with Department of Horticulture – selection allows for analysis of impacts of clustering on inclusions outcomes.

Step 3: Selection of markets – all vegetable/fish markets in selected blocks, all municipal vegetable/fish markets in selected districts, 4 'terminal markets (major wholesale markets) outside selected districts. Excluded markets with <20 retailers. Total 163 markets.

Step 4: Identification of agricultural input suppliers. Used list of input suppliers registered with GoO and listed unregistered suppliers in surveyed markets. Randomly selected 500 input suppliers from list of 1870 registered and surveyed all discovered unregistered input suppliers (n=628)

Step 5: Listed all vegetable traders from 163 markets (total 11,439, of which 381 wholesalers, 11,058 retailers). Randomly selected 15 retailers per market from list and interviewed universe of wholesalers



Survey design, phase 1

Working with: MICHIGAN STATE UNIVERSITY, EGERTON UNIVERSITY, IFPRI

Step 1: Questionnaire design: Workshop to design integrated set of questionnaires for off-farm value segments (markets, wholesalers & retailers, input suppliers) to answer research questions from rapid reconnaissance

Step 2: Design of three paper-based questionnaires: 1) Markets, 2) Traders – single instrument covering wholesalers & retailers, 3) Input suppliers.

Step 3: Translation of questionnaires to Odia language and multiple rounds of pre-testing to ensure effectiveness

Step 4: Ethical clearance

Step 5: Digitization of surveys for use with Survey CTO, further pretesting

Step 6: Survey implementation

Step 7: Data checks, preliminary data cleaning

Survey design, phase 1

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Outline of market survey questionnaire

Module	Section / Module title
Cover	Consent/cover sheet
A	General market information
B1&2	Seasonality and volume of vegetables traded
C	Trader associations
D	Trader composition
E 1&2	Businesses and services in the vicinity of the market
F	Market facilities
G	Institutions responsible for market operation
H	Toilet facilities
I	Electricity
J	Waste disposal
K	Distances to amenities
L	Shocks
M	Indicators
N	End

Survey design, phase 1

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Outline of stacked survey questionnaires for traders

Module	Section / Module title
Cover	Consent
A	Respondent details
B	Business history
C1&2	Business seasonality
D1	Most recent sale (buyer profile)
D2	Most recent sale (transaction details)
D3	Most recent purchase (supplier profile)
D4	Most recent purchase (transaction details)
D5	Most recent purchase (transport details)
F1&2	Credit (given and taken)
G	Association membership
H	Record keeping
I	Labor
J	Recurrent costs
K	Business assets
L	Shocks

Survey design, phase 1

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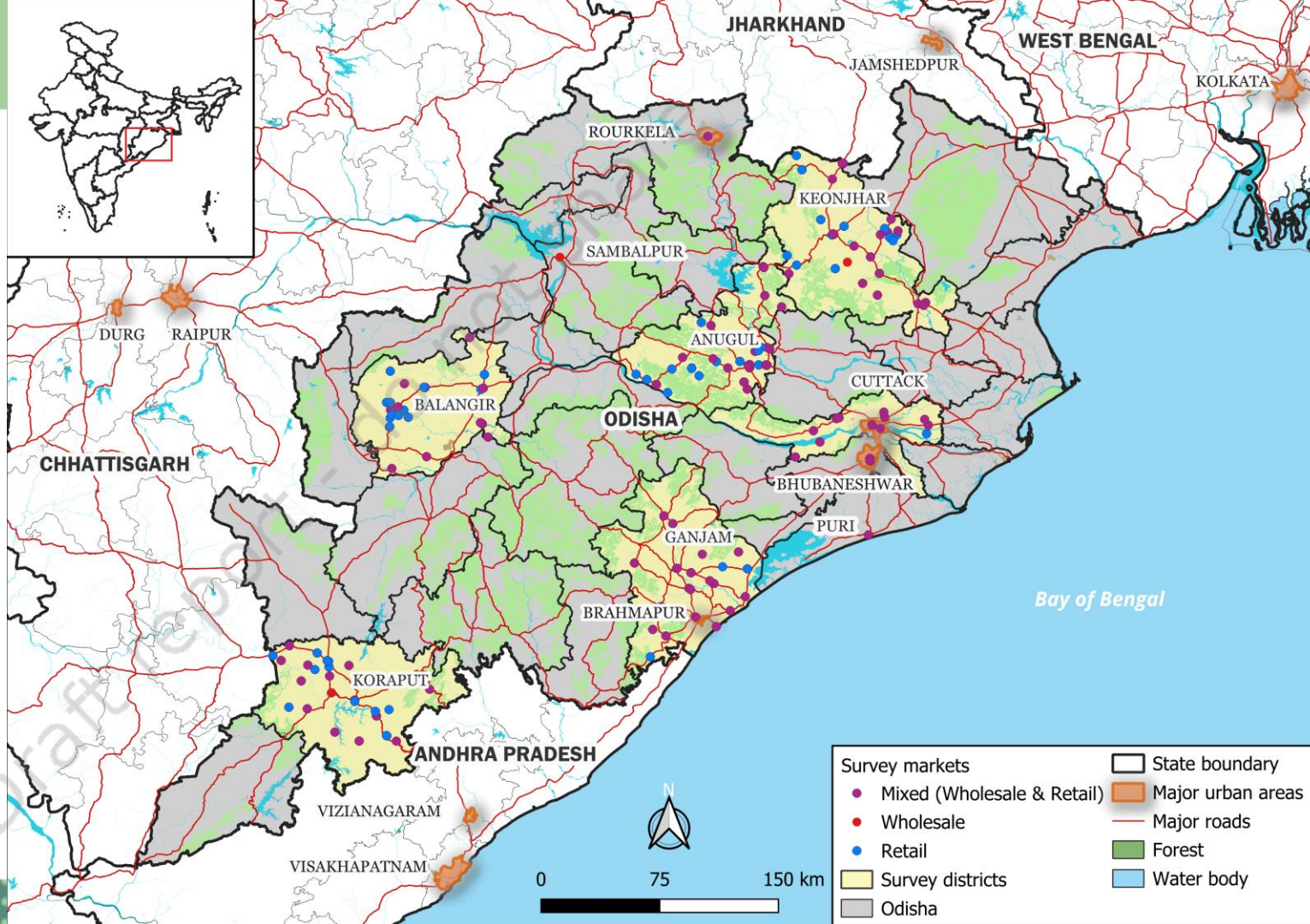
Outline of stacked survey questionnaires for input suppliers

Module	Section / Module title
Cover	Consent
A	Respondent details
B	Business history
C	Business seasonality
D1	Most recent sale
D2	Most recent vegetable seed sale
D3	Most recent pesticide sale
D4	Most recent fertilizer sale
E1	Equipment and services provision
E2	Business organization
E3	Inventory history
F1&2	Credit (given and taken)
H	Record keeping
I	Labor
J	Recurrent costs
K	Business assets
L	Shocks

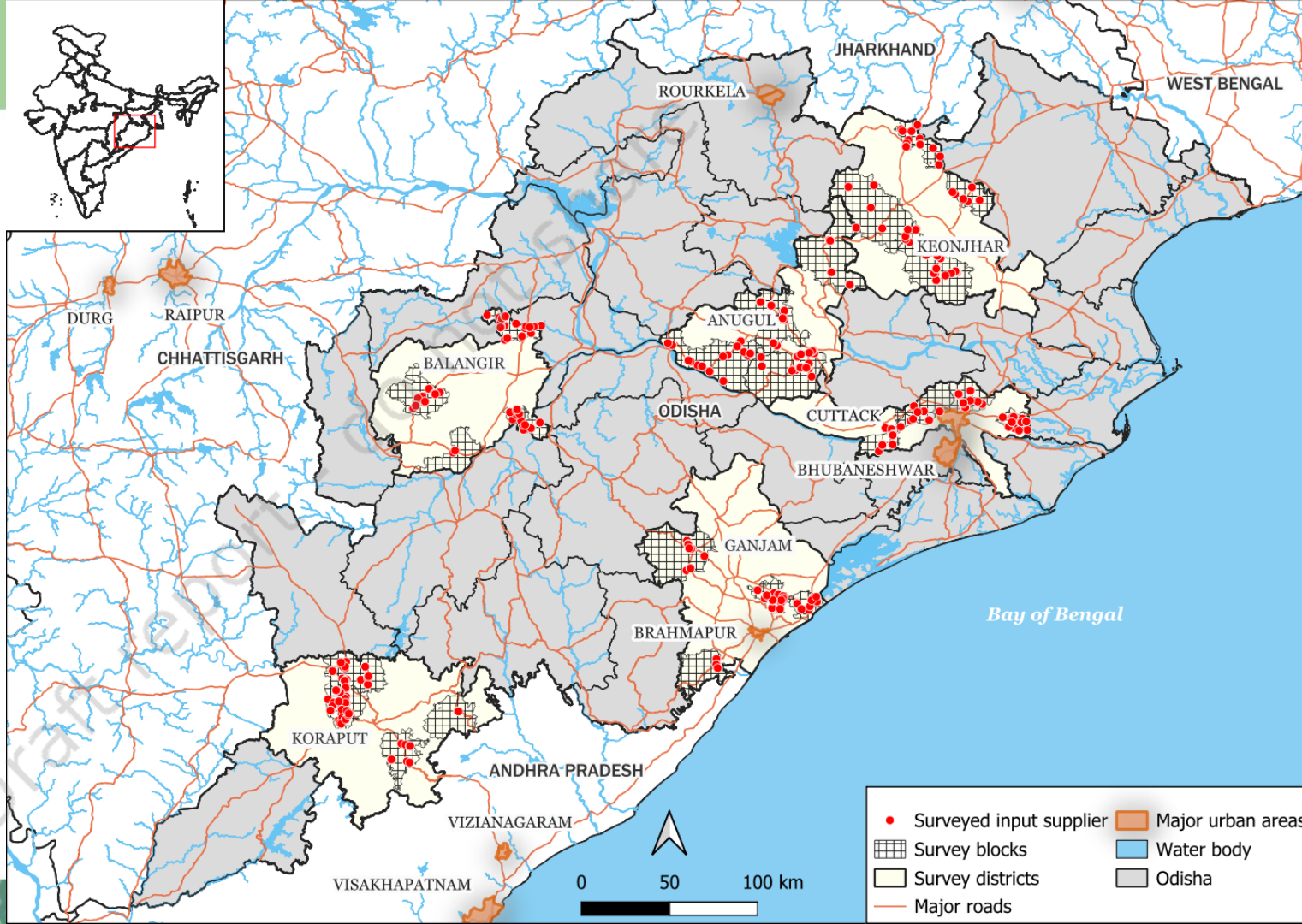
Off-farm sample

Map showing the location of markets and traders selected for inclusion in the INCATA survey



Off-farm sample

Map showing the location of input suppliers included in the INCATA survey



Survey results: Market survey

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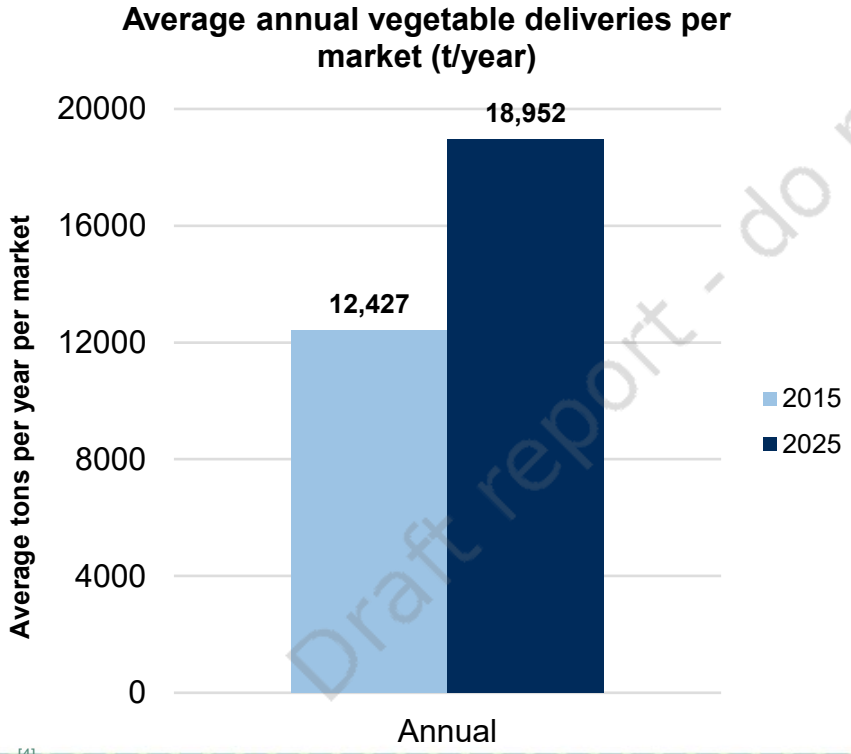
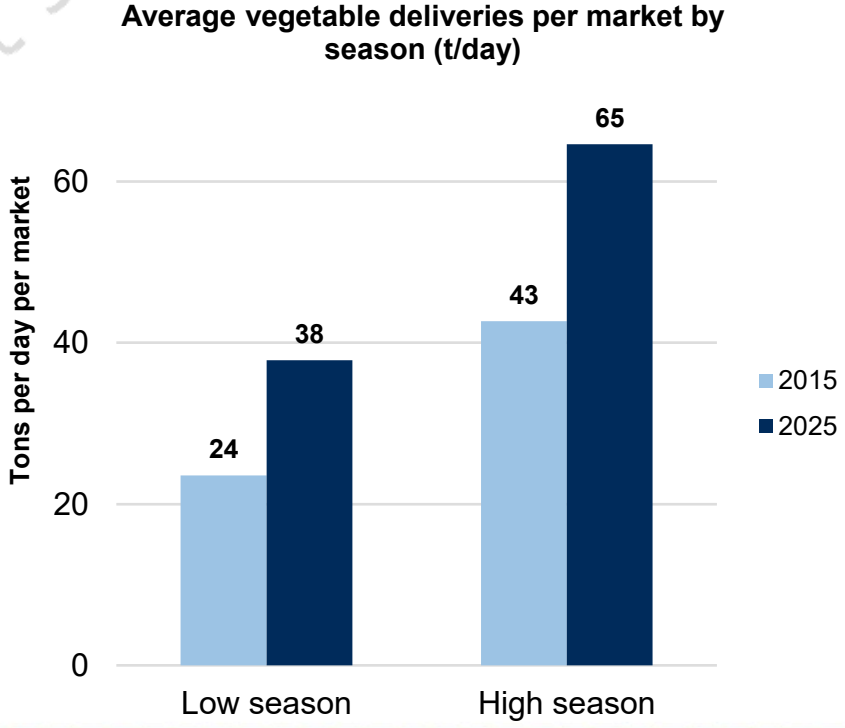
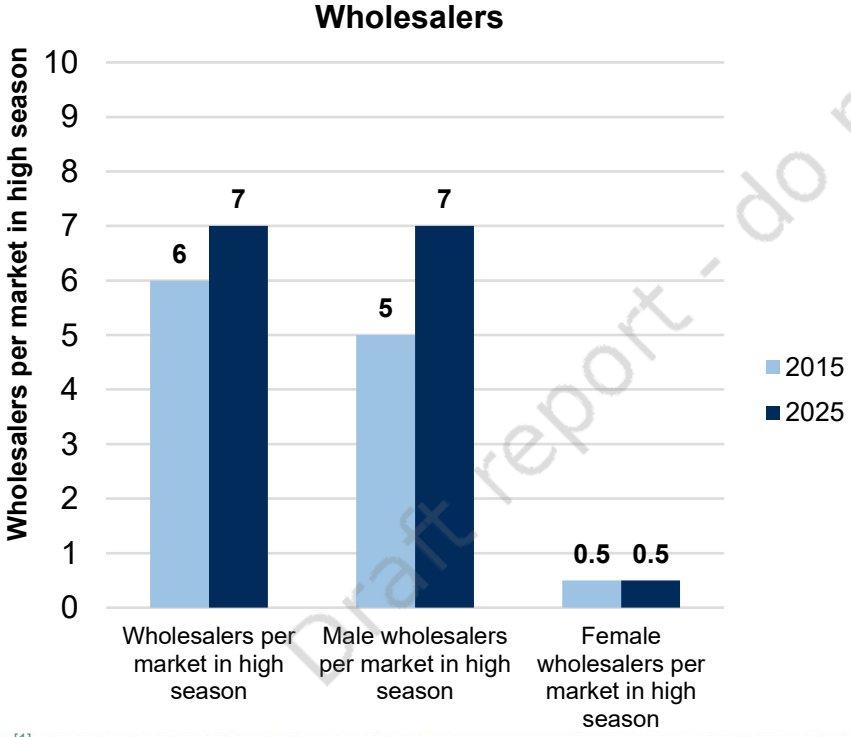
Total volume of vegetables traded in surveyed markets increased 53% in 10 years, low season volumes increased slightly faster than high season (58% vs 51%), suggesting growth in off-season production

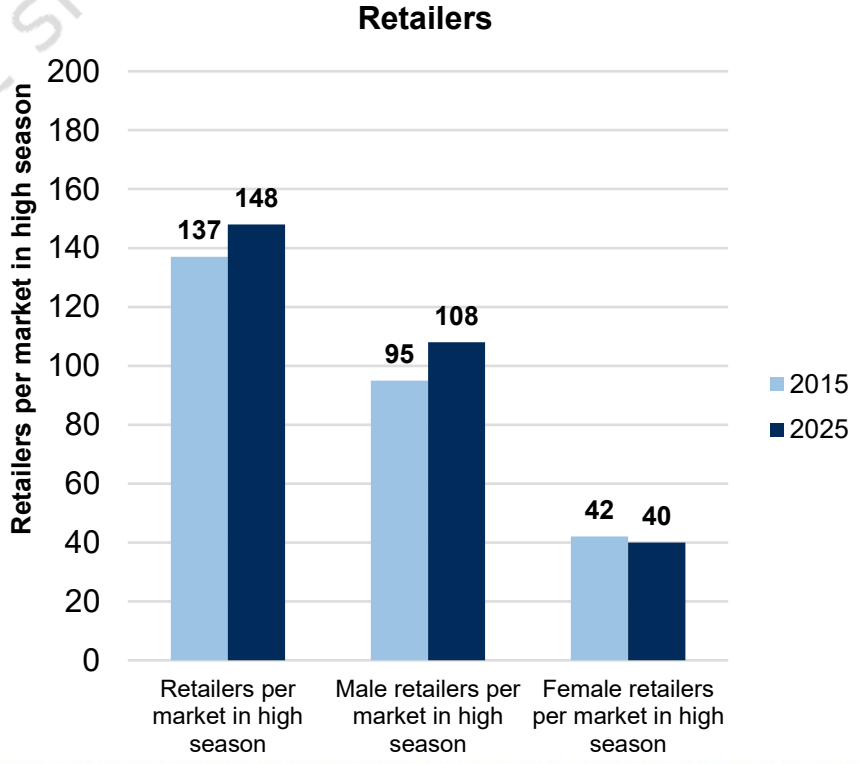




Survey results: Market survey

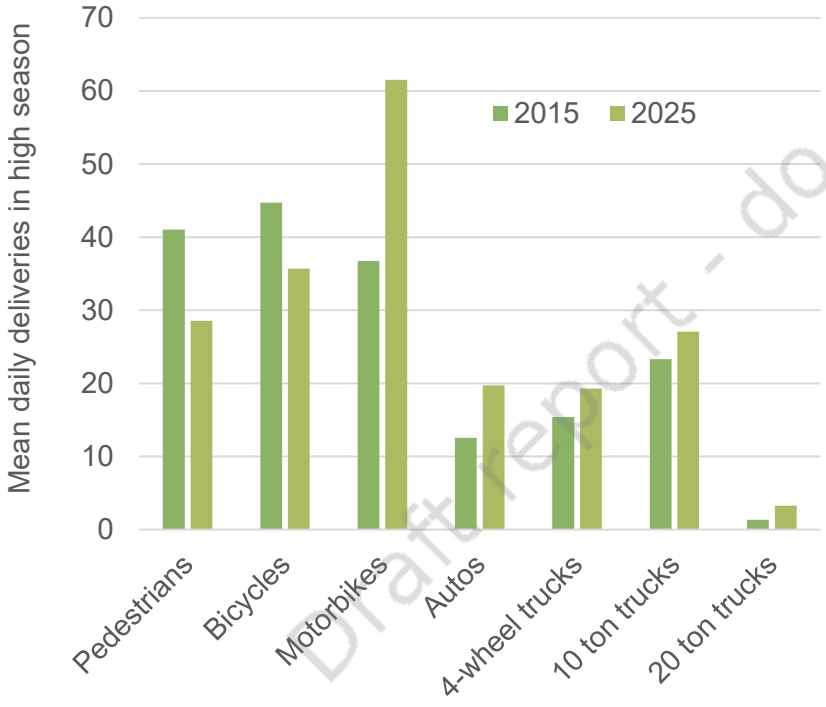
Slight increase in number of wholesalers (17%) and retailers (8%) in surveyed markets in 10 years, driven by growth in male traders (15% increase overall, vs 5% decrease in women traders). Suggests grow in volumes of veg traded occurred at the intensive margin (increasing scale per trader), and retail as become less gender inclusive over time.

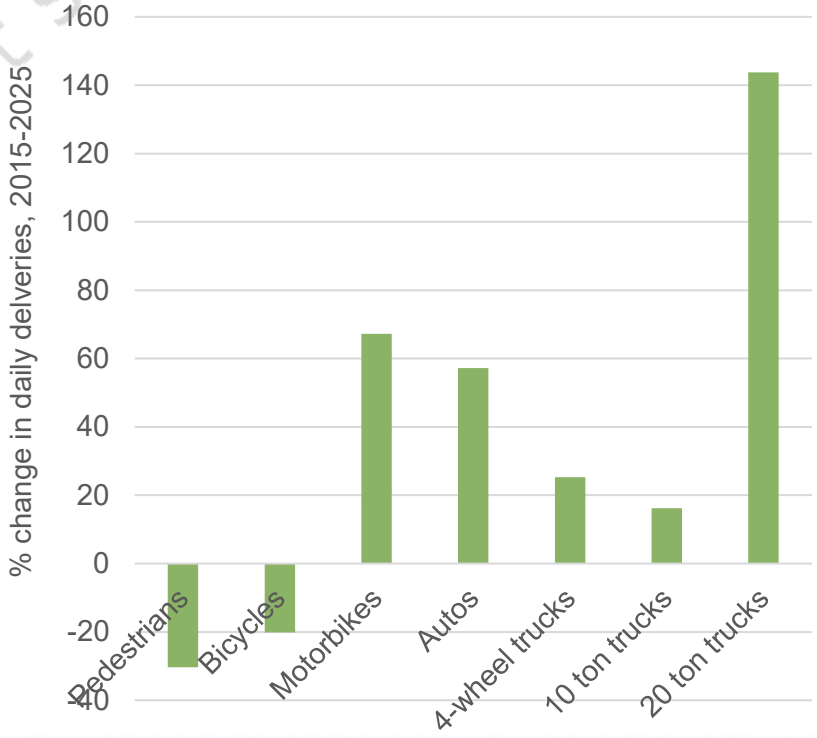




Survey results: Market survey

Shift from deliveries by pedestrians and bicycles to motorbikes and autos (larger capacity, greater speed and ease = more mobility). Increase in deliveries by larger vehicles, especially largest (20-ton truck deliveries up 144%). Together these trends suggest simultaneous increases in local and out of state vegetables supplies.





Survey results: Market survey

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Clusters of enterprises around markets providing ancillary services grew more quickly than the number of markets, suggesting cluster densification took place

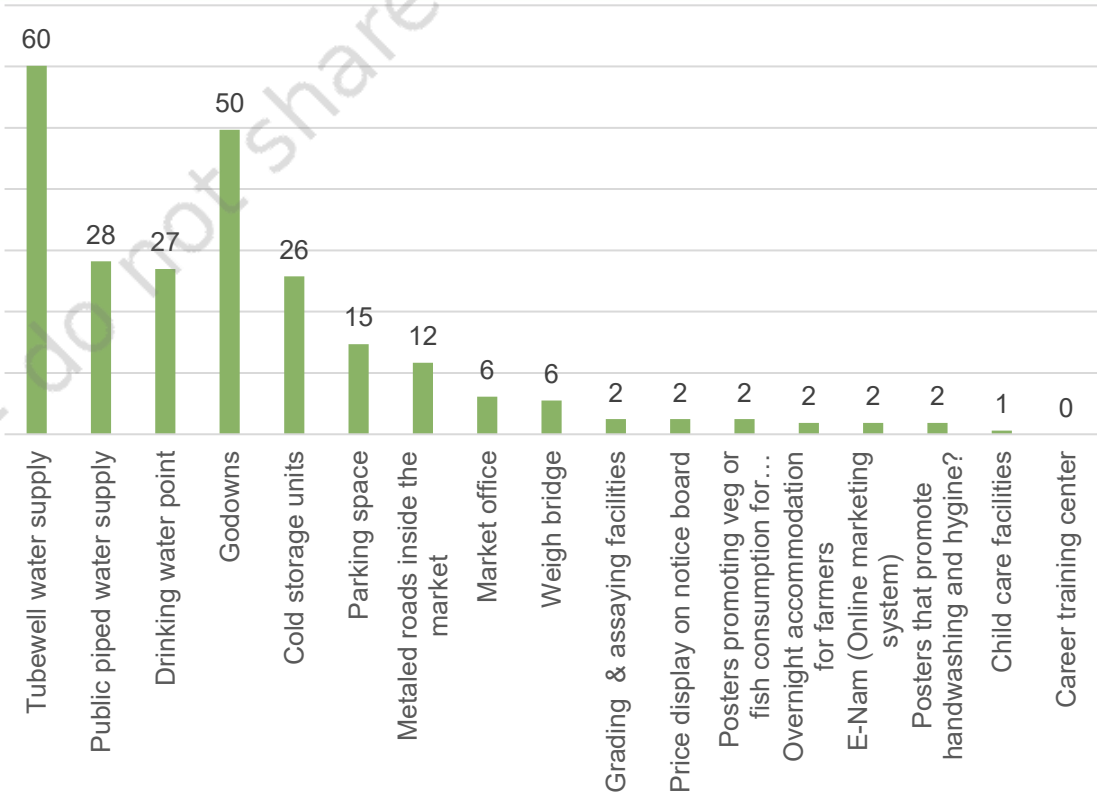
Type of business/service	2015	2025	% change
Number of markets	140	163	16
Upstream			
Agricultural input shops	218	340	56
Agricultural machinery shops	53	98	85
Borewell drilling businesses	6	24	300
Farmer Producer Companies (FPC/FPOs)	10	41	310
Midstream/downstream			
Private cold storage businesses	3	13	333
Trucking logistics companies	88	160	82
Bank branches	75	141	88
ATMs	44	122	177
Ice factories	11	26	136
Foam box sellers	7	33	371
Bag sellers	946	1415	50
Fish cutters	185	285	54

Survey results: Market survey

Limited market infrastructure and services (e.g. 25% of markets have no water, 25% have toilet, 33% have electricity from grid)

Increasing numbers of godowns and cold storage units, especially in public markets, but often out of use

Market has a toilet (%)	25
Trader-toilet ratio (mean)	87
Market has no water (%)	25
Market has electricity from the grid (%)	33
Average hrs/ day market has electricity (conditional mean)	20



% of markets with infrastructure/services

Survey results: Market survey

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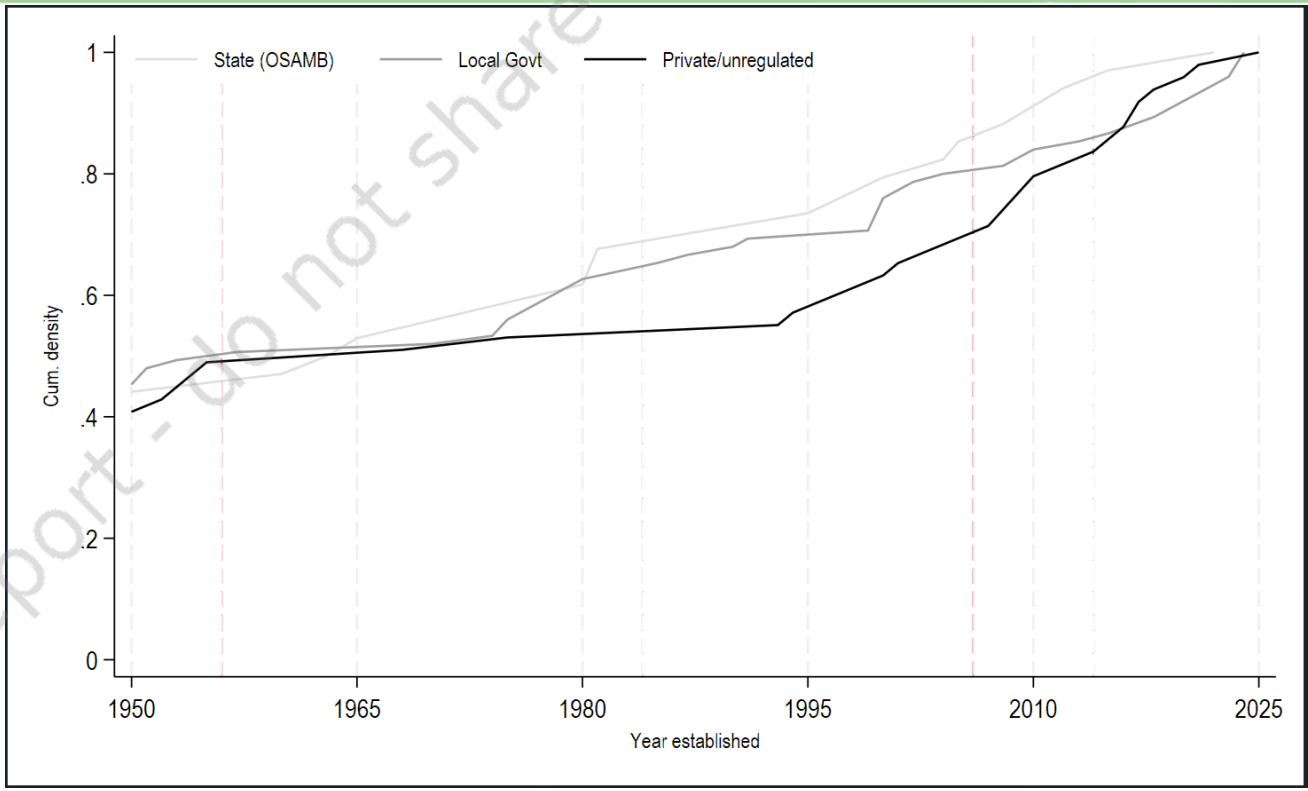
Many markets long established



Cumulative share of state, local government and private markets established, by year

Survey results: Market survey

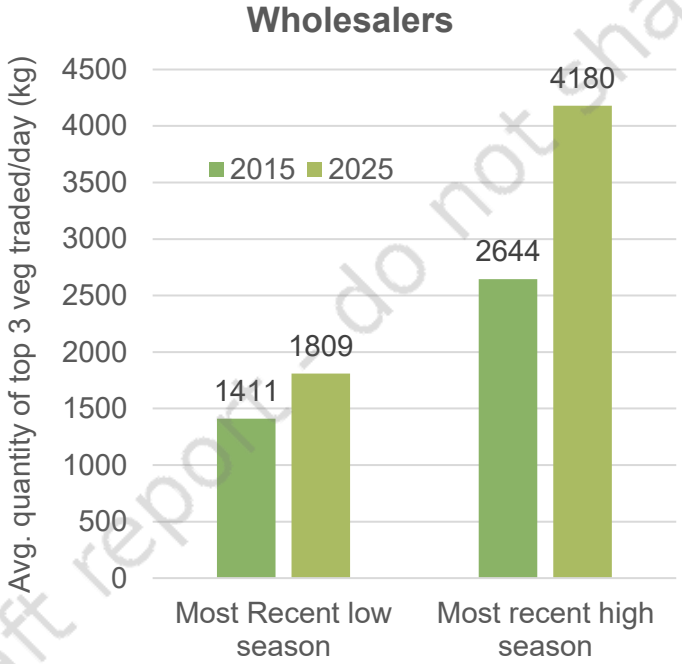
Market formation characteristics

Proportion of markets that were established by...	All	Urban	Rural	Daily	Weekly	Retailer only	Wholesale + retail	State Government	Other Public	Private	Coastal	Eastern Uplands	Koraput Region	Balangir Region	Terminal Market
Government (various levels)	74	70	78	67	86	78	71	76	82	33	64	72	85	88	60
A private entrepreneur	10	11	9	17	5	6	12	0	8	67	29	2	0	8	20
Traders who split from private market	6	6	6	5	4	6	6	3	8	0	7	8	0	8	0
Traders being evicted /moved from a previous location	3	5	1	7	0	0	5	6	3	0	7	0	0	0	40
"Formalizing" a preexisting informal market	2	2	3	5	1	3	2	0	3	0	7	0	0	4	0
Proportion of markets that report being regulated	75	85	65	87	66	69	79	100	100	100	86	78	92	31	80
Among these, share that is regulated by:															
Any government/government-related body	73	62	88	58	89	73	73	100	68	11	44	90	96	25	75
OSAMB	28	23	35	15	45	22	31	100	0	0	8	38	46	0	25
Municipality	20	31	4	35	0	18	21	3	28	11	25	12	25	13	50
Gram Panchayat	29	13	51	12	49	33	26	12	39	0	14	44	29	13	0
Private	13	13	14	17	9	7	17	0	10	89	22	10	0	25	25
Community	1	1	0	0	0	0	1	0	0	11	3	0	0	0	0

Survey results: traders

Growth in volume of vegetables traded per trader is similar to meso-scale (market) growth rate in vegetable deliveries

Faster growth in retailer trade volumes than wholesaler, may indicate increase in sales of own/locally sourced produce



Change in low season: 28%
Change in high season: 51%

Change in low season: 71%
Change in high season: 84%

Survey results: traders

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Retail node more inclusive than wholesale node in terms of direct participation

- Retailers far more numerous than wholesalers
- Vegetable wholesaling dominated by non-SC/ST men
- Retailing more accessible but women, ST, still underrepresented relative to composition of general population

	% of Odisha population*	% of traders	% of wholesalers	% of retailers
Wholesalers	-	6	-	-
Retailers	-	93	-	-
Female	49	21	1	28
Scheduled tribe (**ST**)	23	8	1	10
Scheduled caste (**SC**)	17	12	4	15
Other caste	60	80	96	75

Vegetable trader gender and caste composition

* Data from 2011 Census

Survey results: Input suppliers & traders

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Social identity, human capital, asset base, by type of trader

Item	Input supplier	Wholesaler	Retailer	Male retailer	Female retailer	SC Retailer	ST Retailer	Other caste retailer
Age (years)	45	45	47	47	47	46	49	47
Male (%)	97	99	72	100	0	51	52	80
Female (%)	3	1	28	0	100	50	48	20
Youth (18-39) (%)	31	32	23	24	19	24	22	23
Youth (15-29) (%)	9	7	5	7	1	3	3	6
Hindu (%)	100	99	98	99	96	99	100	98
Scheduled Caste (%)	5	4	15	10	27	100	0	0
Scheduled Tribe (%)	1	1	10	7	18	0	100	0
Other caste (%)	94	96	75	82	55	0	0	100
No formal education (%)	1	4	27	13	65	54	53	18
Any primary education (%)	31	68	63	75	34	40	45	71
Any secondary education (%)	33	19	7	9	1	4	2	8
Any tertiary eduation (%)	36	9	2	3	0	3	1	3
Has migrated before for work? (%)	4	6	9	12	1	11	16	8
Owns agricultural land (%)	67	28	61	63	56	41	77	63
Area owned (acres)	4.4	2.2	2.1	2.2	1.8	1.7	2.6	2.1

Survey results: Input suppliers & traders

Working with: Michigan State University, Egerton University, IFPRI

Entry into vegetable value chain off-farm segments, livelihood diversification

Item	Input supplier	Wholesaler	Retailer	Male retailer	Female retailer	SC Retailer	ST Retailer	Other caste retailer
Started current activity from								
Farming (any) (%)	28	14	38	38	38	28	53	38
Other trading activities (%)	14	5	4	5	3	3	3	5
No previous occupation (%)	38	61	30	25	44	44	26	28
Occupation besides traders or input supplier								
Household's primary source of income (%)	84	10	27	28	27	22	40	27
Respondent's sole occupation (%)	62	89	66	65	67	76	46	66
Respondent has non-agricultural occupation (%)	13	2	3	3	3	5	4	3
Respondent grows vegetables (%)	13	5	22	21	24	15	38	21

Survey results: Input suppliers & traders

Working with: RIMISP, Michigan State University, Egerton University, IFPRI

Reasons for entry into vegetable value chain off-farm segments

Item	Input supplier	Wholesaler	Retailer	Male retailer	Female retailer	SC Retailer	ST Retailer	Other caste retailer
Reason for entering the business (%)								
Lucrative opportunity	46	26	44	40	52	61	51	39
Occupation of last resport	20	11	25	21	34	29	36	23
Wanted to sell surplus from own farm	n/a	5	26	22	33	32	32	23
Learned by working with family member	18	31	19	18	21	33	9	18
Learned by working for another trader	21	24	18	17	20	31	10	17
Given enterprise by family member	24	14	13	12	18	26	7	12
Wanted to diversify farming activities	26	3	13	11	19	27	6	11
No particular reason	14	14	13	13	12	4	25	13
Saw others like myself do this work	3	3	4	5	3	8	2	4
Wanted to get cheap inputs for own farm	27	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Caste based occupation	4	1	2	1	5	8	2	1
Timepass occupation	6	1	1	1	1	1	0	1
Was doing other business and that didn't work out	1	1	1	1	0	1	0	1

Survey results: Input suppliers & traders

Working with: MICHIGAN STATE UNIVERSITY · EGERTON UNIVERSITY · IFPRI INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE

Business sentiment, perceived challenges in business expansion

Item	Input supplier	Wholesaler	Retailer	Male retailer	Female retailer	SC Retailer	ST Retailer	Other caste retailer
Expectation to expand or contract (%)								
Expectation to expand	82	72	78	74	87	93	86	73
Expectation to contract	5	8	8	10	4	2	6	10
Remain the same	12	20	14	16	9	5	7	17
Challenges in expanding (%)								
Too much competition	27	39	41	44	31	48	26	41
No big problems	42	19	20	16	32	23	46	17
Demand is not growing fast enough	22	42	25	27	19	22	12	27
Space constraints	7	13	18	14	27	37	11	15
Labour constraints	8	10	19	16	26	30	14	17
Supply is not adequate	11	20	18	19	15	23	10	18
Local supply from Odisha inadequate	9	25	16	18	11	22	10	16
Time constraints	8	5	15	11	25	33	14	12
Am getting old, succession is a problem	3	2	6	5	8	6	10	5
Access to transport vehicles	2	3	6	5	7	11	4	5
Unreliable suppliers /buyers	4	2	4	4	4	2	6	4
Credit availability	3	2	4	4	3	2	0	4
Don't have family support	1	2	3	2	4	4	2	3
Operational costs are too high	1	1	3	4	1	4	1	3
Making losses in this business	0	2	3	2	3	3	0	3
Others	10	9	8	10	5	6	5	9

Survey results: Input suppliers & traders

Working with: MICHIGAN STATE UNIVERSITY · EGERTON UNIVERSITY · IFPRI INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE

Volume of startup capital, business assets, access to credit

Item	Input supplier	Wholesaler	Retailer	Male retailer	Female retailer	SC Retailer	ST Retailer	Other caste retailer
Start up capital in current prices (INR)	191,869	289,322	7,782	8,354	6,275	6,791	5,609	8,279
Current asset value (INR)	783,293	549,619	33,751	39,324	19,076	22,953	25,802	36,986
Preferred lender								
Formal /institutional	27	21	7	7	6	8	1	8
Informal lender	2	5	6	7	3	8	2	6
Relatives/friends	22	21	30	33	21	23	27	32
Other veg-related business	0	1	2	2	1	3	1	2
Borrowed in 2024	14	16	10	10	9	8	3	12
Not credit constrained - self reported (%)	45	46	45	46	41	39	58	44

Survey results: Input suppliers & traders

Working with: RIMISP, Michigan State University, Egerton University, IFPRI – International Food Policy Research Institute

Characteristics and conditions of most recent purchase

Item	Input supplier	Wholesaler	Retailer	Male retailer	Female retailer	SC Retailer	ST Retailer	Other caste retailer
Supplier in the most recent acquisition was a woman (%)	n/a	1	1	0	3	1	1	1
Most recent purchase was from a regular supplier (%)	n/a	73	60	60	59	60	70	58
Supplier is trusted (%)	n/a	57	52	52	54	63	47	51
Can pay the supplier later (%)	n/a	33	25	19	44	37	38	20
Supplier is a relative (%)	n/a	9	15	15	14	13	24	15
Supplier is a regular trading partner (%)	n/a	12	6	6	5	3	0	7
Supplier borrowed cash or inputs (%)	n/a	0	0	0	0	1	0	0
Paid fully in advance (%)	n/a	4	8	8	9	4	11	9
Partially on credit (%)	n/a	54	72	71	77	82	84	69
Fully on credit (%)	n/a	41	19	21	14	14	5	22
Respondent had a prior loan with supplier (%)	n/a	14	9	8	11	8	15	8
Was obliged to buy from supplier or relatives on account of a loan (%)	n/a	6	19	25	4	0	9	24
Obliged to buy from suppliers and relatives but can buy from others (%)	n/a	67	60	46	96	83	82	52
Had loan but free to source from anyone (%)	n/a	27	21	30	0	17	9	24
Sale price is set mostly by respondent (%)	n/a	34	39	39	37	18	39	43
Sale price is mostly set by supplier (%)	n/a	6	7	9	2	5	3	8
Bilateral negotiation in advance or on the spot (%)	n/a	55	53	51	60	75	58	48
Price depends on the identy of the buyer (%)	n/a	3	5	4	10	17	6	3
Traders collectively set the price in this market (%)	n/a	0	1	0	2	3	2	0
Quality was the same as expected (%)	n/a	83	80	84	69	73	66	83
Quality was different but no power to do anything (%)	n/a	60	36	45	24	14	16	49
Quality was different and raised it with supplier (%)	n/a	5	4	6	3	4	2	5
Shared the vehicle for sourcing, and is a regular arrangement (%)	n/a	4	8	8	8	9	12	7

Survey results: Input suppliers & traders

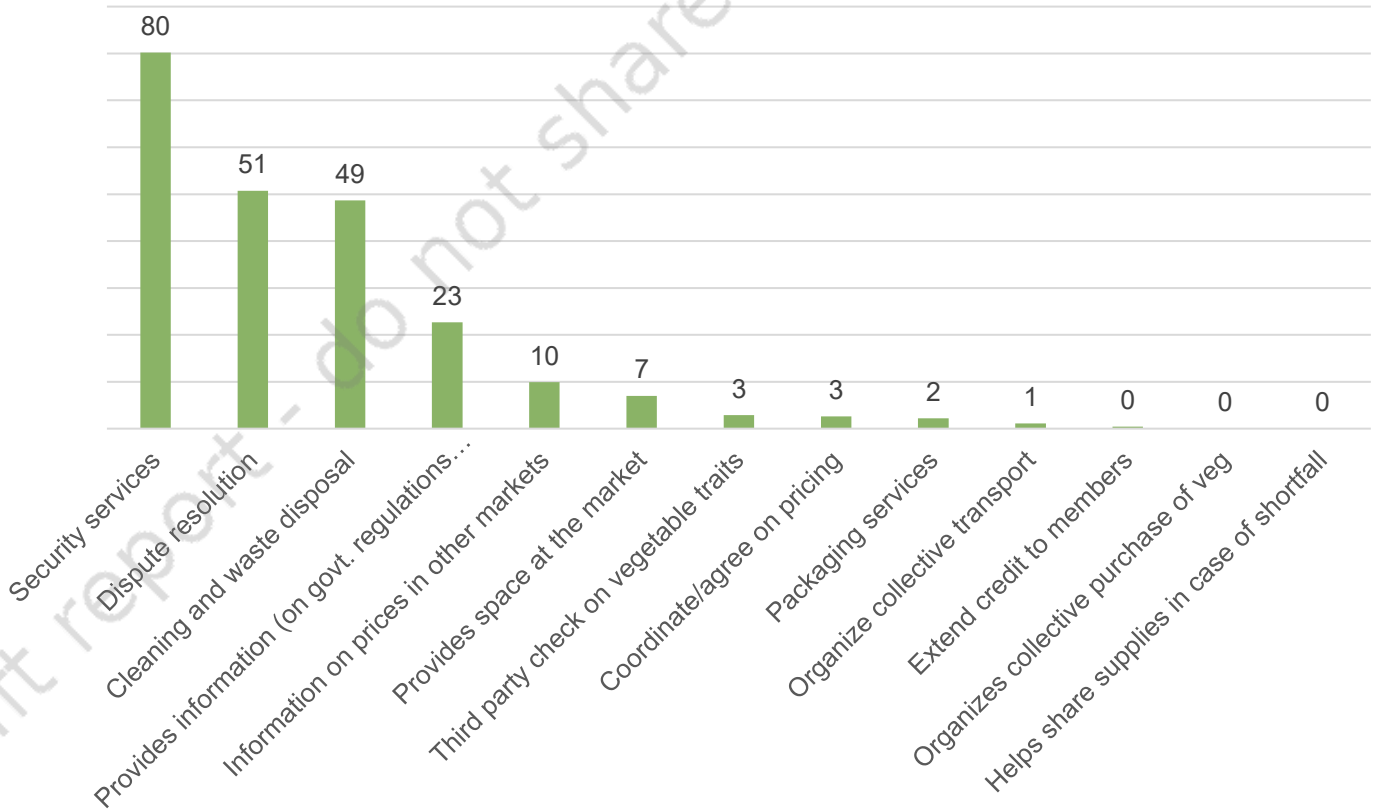
Working with: MICHIGAN STATE UNIVERSITY · EGERTON UNIVERSITY · IFPRI INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE

Interlinked credit, associations, relational linkages

Item	Input supplier	Wholesaler	Retailer	Male retailer	Female retailer	SC Retailer	ST Retailer	Other caste retailer
Interlinked credit (%)								
Loans to suppliers with obligation to sell to respondent in 2024	0	1	0	0	0	0	0	1
Loans to buyers with obligation to buy from respondent in 2024	0	1	1	1	1	0	1	1
Borrowed from others in the veg value chain	0	1	0	0	0	0	0	0
Typically borrow from others in the veg value chain	0	1	2	2	1	3	1	2
Associations (%)								
Respondent is a member of any association	9	41	9	13	1	6	0	11
Member of association that assists in collective services	5	20	5	7	0	5	0	6
Member of association that agree or coordinate on pricing	0	1	0	0	0	0	0	0
Has relatives engaged in vegetable related businesses (%)	11	4	11	10	12	8	11	11
In the same market	39	59	48	39	67	86	43	43
In other market	14	12	23	25	19	7	36	24
In a similar business	17	0	3	2	5	0	7	3
In off market or online shop	3	0	1	1	0	0	0	1
Has relational links with relatives (conditional) (%)	29	53	51	45	64	71	50	48
Transacting	76	78	63	61	67	80	43	63
Brokering and referrals	19	44	34	29	41	80	57	22
Cover shortfalls	10	33	29	32	26	10	29	33
Resource sharing - storage, labour, vehicles	10	33	12	17	4	20	0	12
Financiers	0	44	6	7	4	20	0	4
Licences	5	0	1	0	4	0	14	0
Trading partner assisted during the most recent shock	0	2	0	0	0	0	0	0

Survey results: traders

- **Main functions performed by trader associations are security services, dispute resolution and waste disposal**
- **Little collective action in support of marketing activities**



Functions performed by trader associations (% of markets with associations reporting function)

Survey results: Input suppliers & traders

Working with: RIMISP, Michigan State University, Egerton University, IFPRI

Informality, business establishments

Item	Input supplier	Wholesaler	Retailer	Male retailer	Female retailer	SC Retailer	ST Retailer	Other caste retailer
Informal enterprise (%)	9	37	69	78	46	53	57	74
Registered sole proprietorship (%)	47	62	30	22	53	46	43	26
Cooperative (%)	1	0	1	1	1	1	0	1
Private ltd company (%)	4	0	0	0	0	0	0	0
Partnership (%)	0	1	0	0	0	1	0	0
Farmer Producer Company/Organization (%)	1	0	0	0	0	0	0	0
Licensed shop (%)	33	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Holds any business license (%)	94	41	8	10	4	4	2	10
Enterprise has >1 establishment (%)	4	9	8	9	5	6	6	9
Operates routinely in the same market (%)	88	82	44	43	48	37	31	47
Trades everyday in the same market (%)	86	79	35	36	35	30	16	39
Sells from a fixed spot in the market (%)	95	96	89	89	88	91	96	87

Survey results: Input suppliers & traders

Working with: RIMISP, Michigan State University, Egerton University, IFPRI

Phone ownership, digital payments, communication and record keeping

Item	Input supplier	Wholesaler	Retailer	Male retailer	Female retailer	SC Retailer	ST Retailer	Other caste retailer
Has a smart phone (%)	79	66	34	42	12	26	20	37
Has a basic mobile phone (%)	5	7	17	20	9	15	7	19
Has any mobile phone (%)	83	72	50	61	21	40	27	55
Has computer (%)	7	3	0	0	0	0	0	0
Business has online presence (%)	7	4	1	1	0	0	1	1
Record keeping on computer (%)	7	6	0	0	0	0	0	0
Record keeping on app (%)	0	0	0	0	0	0	0	0
Used digital means to contact potential sellers	n/a	1	1	1	3	0	0	2
Used phone to contact potential sellers	n/a	30	46	44	62	39	60	47
Used digital means to contact potential buyers or vice versa	n/a	0	0	0	0	0	0	0
Used phone to contact potential buyers or vice versa	n/a	83	94	91	100	100	100	93
Payment by UPI (QR code)								
Most recent sale	n/a	14	2	2	1	1	0	2
Most recent purchase	n/a	28	6	7	2	3	3	7
Payment in cash								
Most recent sale	n/a	97	99	98	100	100	100	99
Most recent purchase	n/a	86	98	98	100	100	100	98

Survey results: Input suppliers & traders

Working with: MICHIGAN STATE UNIVERSITY · EGERTON UNIVERSITY · IFPRI INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE

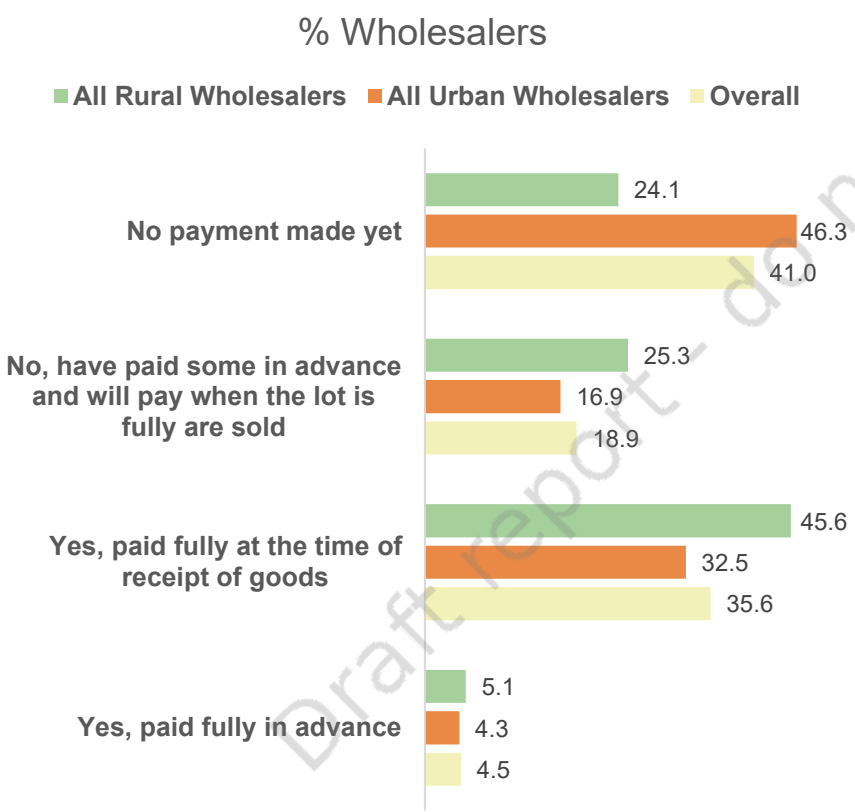
Most recent sale: Buyer characteristics, credit relations, means of price setting

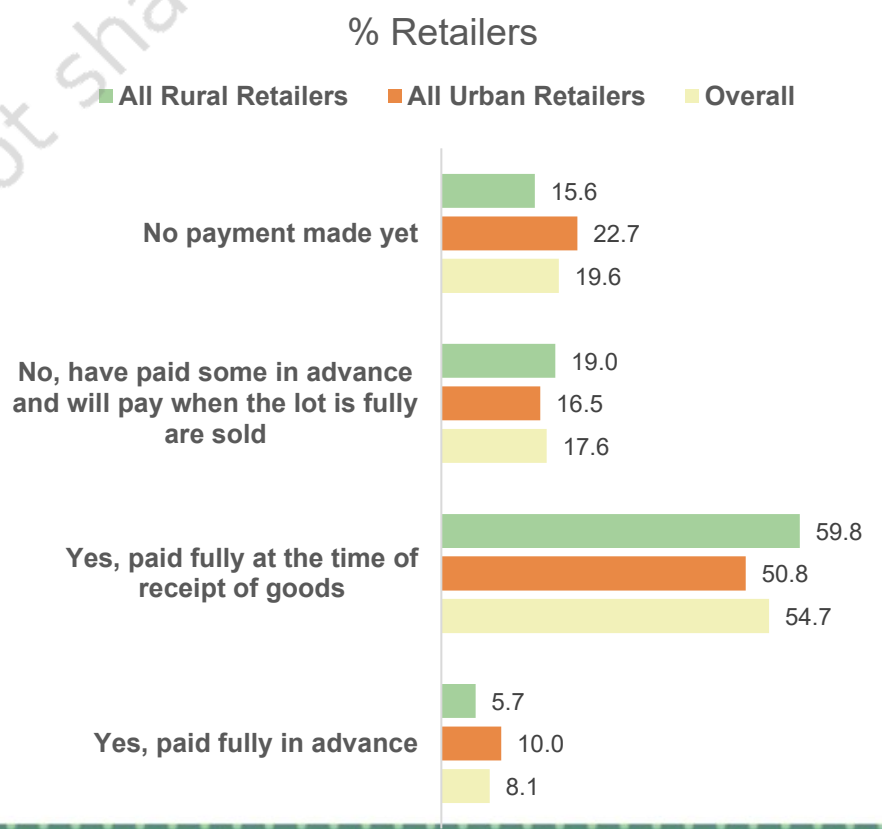
m	Input supplier	Wholesaler	Retailer	Male retailer	Female retailer	SC Retailer	ST Retailer	Other caste retailer
Value of most recent sale (INR)	1742	1448	115	139	56	144	102	506
Buyer in most recent sale was a woman	5	8	18	12	35	29	30	14
Most recent sale was to regular buyer (%)	51	58	32	34	28	31	30	33
Most recent sale was paid fully in advance (%)	3	7	5	6	5	4	5	6
Most recent sale was partially on credit (%)	1	13	1	1	0	0	1	1
Most recent sale was fully on credit (%)	2	22	1	1	0	0	0	1
Buyer had a prior loan (%)	n/a	8	1	1	1	0	2	1
Most recent buyer obliged to sell only to respondent due to prior loan (%)	n/a	6	50	46	67	0	67	46
Most recent buyer obliged to sell to respondent but can trade with others (%)	n/a	50	25	23	33	0	33	23
Most recent buyer had loan but free to sell to anyone (%)	n/a	44	25	31	0	0	0	31
Respondent provided services to buyer free of charge (%)	n/a	24	5	6	1	2	1	6
Means of price setting	n/a							
Bilateral negotiation in advance or on the spot (%)	n/a	47	47	44	56	70	54	42
Sale price is set mostly by respondent (%)	n/a	45	50	53	43	28	44	55
Sale price is mostly set by buyer (%)	n/a	2	3	3	1	2	2	3
Sale price is set by auction (%)	n/a	6	1	1	0	0	0	1

Survey results: traders

Working with: Michigan State University · Egerton University · IFPRI

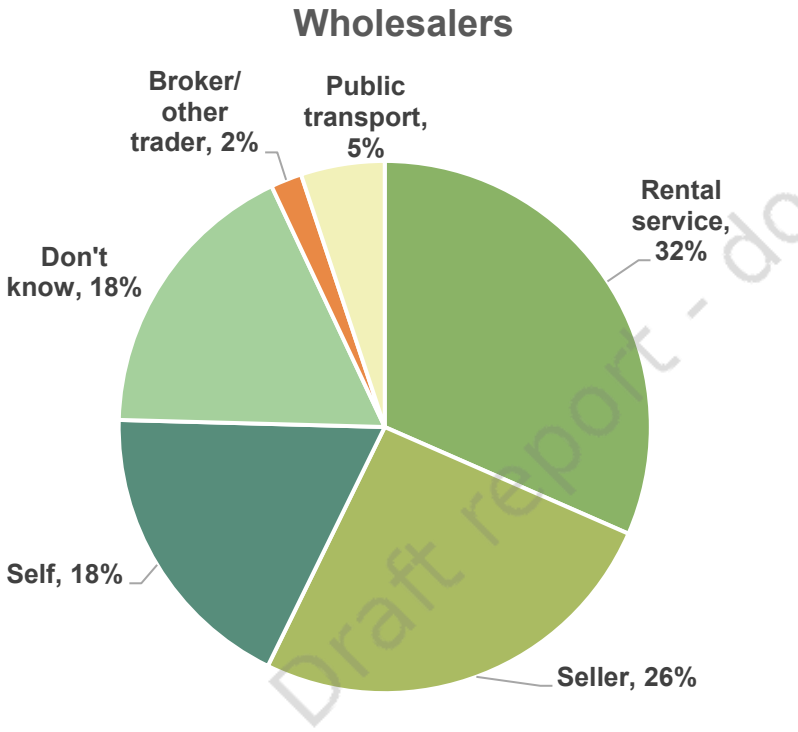
Status of payment made to supplier in most recent transaction

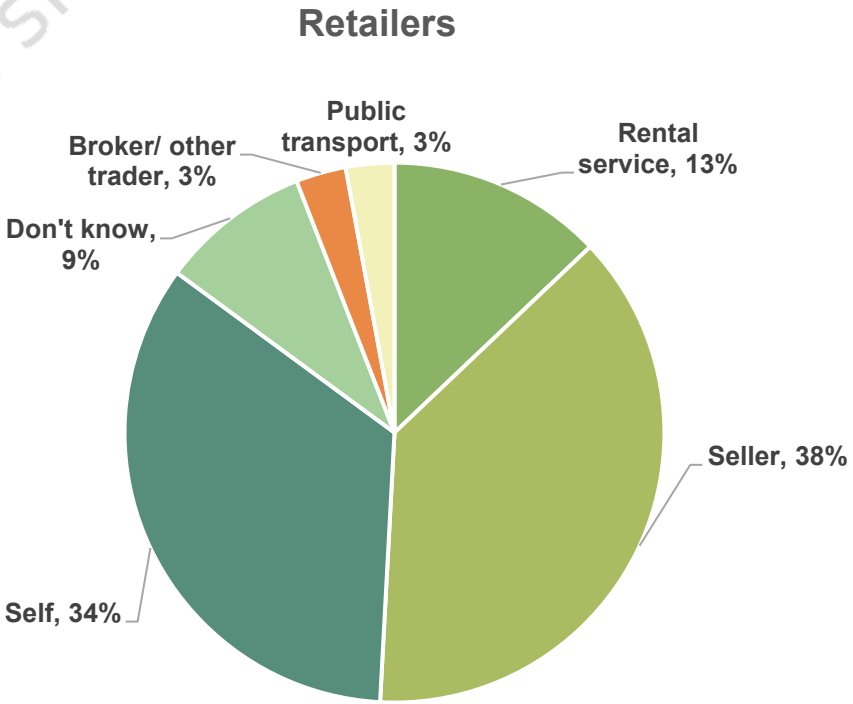




Survey results: traders

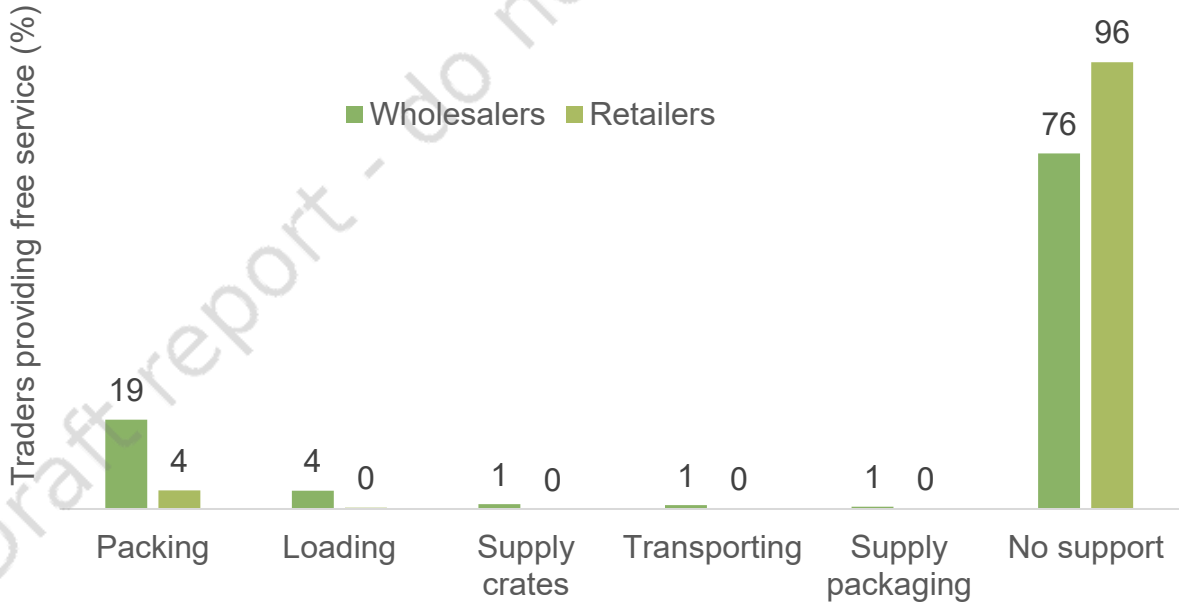
Ownership of vehicle used for most recent procurement





Survey results: traders

Share of wholesales and retailers providing free services to customer in most recent transaction



Survey results: traders

Correlates among trader characteristics and inclusion indicators

(odds ratios: values >1 indicate positive correlation; values <1 = negative correlation)

	Trader Survey	Binary Dependent variable (Logistic Regression)										
		Trader is Retailer (Y/N)	Trader is wholesaler (Y/N)	Always trade insame spot? (Y/N)	Has any kind of business license (Y/N	Gender of most recent buyer (M = 0/F =1)	Respondent owns shop/stall (Y/N)	Respondent hires any non-family labor (Y/N)	Experienced any shock (Y/N)	Received assistance (Y/N; conditional on shock)	Borrowed money for veg business (Y/N)	Member of association (Y/N)
	Percentage	**76**	**24**	**90**	**77**	**16**	**16**	**13**	**42**	**12**	**12**	**17**
		Odds ratio										
Gender (base = male)												
	Female	14.3***	0.1***	0.8	0.9	2.4***	0.1***	0.1***	0.8	0.4	1.2	0.1***
Caste (base = other caste)												
	Scheduled caste	2.7***	0.4***	1.3	1.2	1.0	0.6	0.4*	1.5*	1.0	0.8	0.6
	Scheduled tribe	5.4**	0.2**	4.1***	0.6*	1.1	0.4	0.2	0.7*	1.0	0.3**	1.0
Education (base = completed primary)												
	Primary complete											
	Below primary	2.3***	0.4***	0.7*	1.0	1.1	0.6**	0.5***	0.8	1.2	0.9	1.2
	Secondary or above	0.6**	1.6**	1.2	0.6**	0.7	1.5**	1.4*	0.9	0.2***	1.1	1.3
Migration (base = never migrated)												
	Ever migrated	1.3	0.8	1.0	0.7	1.1	0.7	0.5*	0.5***	0.1**	1.9**	0.3***
Land ownership (base = no)												
	Yes	2.3***	0.4***	0.8	1.0	1.2	1.1	0.4***	1.3*	0.7	1.7**	0.7*
Geography (base =coastal plain)												
	Western uplands (Anugul/Keonjhar)	5.0***	0.2***	0.4***	1.1	1.6*	0.4***	0.3***	1.9***	0.1***	1.4	0.2***
	Eastern uplands (Koraput)	1.1	0.9	0.6	16.9***	6.1***	0.1***	0.9	3.4***	0.0***	0.4**	1.0
	Eastern plateau (Balangir)	19.7***	0.1***	0.8	1.0	1.8**	0.1***	0.1***	0.2***	0.2	0.4**	0.7
	Terminal markets	0.3***	3.3***	1.0	0.2***	0.9	1.6*	4.5***	0.9	2.6	1.5	2.6***
Market governing body (base = OSAMB)												
	Other public entity	1.4*	0.7*	1.1	0.7*	1.1	1.9***	0.7	1.3*	0.5*	0.9	1.4
	Private entity	0.6	1.7	1.7	0.4***	1.4	0.7	0.6	0.5**	1.0	0.3**	0.6
	No regulatory authority	0.7*	1.5*	0.6*	0.6**	1.5*	2.4***	1.3	0.8	0.2*	0.9	1.8**
Trades in urban market (base = no)												
	Yes	1.1	0.9	0.8	0.3***	1.1	0.9	1.2	0.5***	0.9	1.5**	2.8***
	Pseudo R2	36	36	4.7	19.3	12.9	20.4	29.7	12.2	26.1	6	22.6
	N	1623	1623	1502	1442	1623	1623	1623	1623	620	1623	1332

Differences found to be statistically significant are indicated by level: * p<0.1, ** p<0.05, *** p<0.01

Survey results: traders

Correlates among trader characteristics and indicators of business performance

	Trader Survey	Value of startup capital (INR, adjusted with CPI)	Average value of sales/day in high season (INR)	Value of most recent sale (INR)	Current total value of all business assets (INR)	Total number of labor hours (family + hired)	Total number of labor hours (hired only)	Share of labor hours worked by women (%)	Total borrowed (INR)
		Continuous dependent variable (OLS Regression)							
	Mean	**71,076**	**7,966**	**553**	**155,805**	**478**	**222**	**7**	**25,424**
		coefficient							
Gender (base = female)									
	Female	-15900.5	-3185.3***	-57.0	-27457.4*	-256.9***	-159.1***	4.5	5155.4
Caste (base = other caste)									
	Scheduled caste	-49525.9**	-269.3	-103.4	-44496.5**	-79.9	-79.6**	8.2	10343.5
	Scheduled tribe	-21.8	-858.0	-15.1	-8921.9	-170.9***	-1.3	23.5	-21681.9**
Education (base = completed primary)									
	Primary complete								
	Below primary	23179.2	-2281.8***	-210.9*	-34712.8*	-160.7***	-109.9***	11.4***	-346.6
	Secondary or above	-24335.1	3437.6***	-9.3	173661.8***	61.1	62.6	1.7	18017.9
Migration (base = never migrated)									
	Ever migrated	-40089.3*	-1291.1*	-382.2**	-3203.6	-38.3	-162.9***	-6.5	-8362.3
Land ownership (base = no)									
	Yes	-80787.1**	-1340.6**	122.0	-44256.3*	-246.3***	-191.6***	4.2	6950.5
Area of land owned		-2410.8	-135.5*	89.7	1753.4	24.6*	2.3	-0.5	-4194.5
Geography (base =coastal plain)									
	Western uplands (Anugul/Keonjhar)	5147.9	-6618.6***	-629.6**	-58597.9*	-201.8***	-231.4***	9.7**	-7338.2
	Eastern uplands (Koraput)	-15269.0	-2275.1*	-444.7***	23223.4	231.3*	-25.1	14.3*	7773.7
	Eastern plateau (Balangir)	-20921.4	-4211.1***	-401.5***	-76972.5*	-240.8***	-319.1***	7.3	-10773.0
	Terminal markets	776270.9**	778.5	3359.3*	119273.6	1107.7***	427.6***	-0.9	-30438.1***
Market governing body (base = OSAMB)									
	Other public entity	6598.0	-1754.5**	282.3	17446.9	3.3	-26.6	4.2	4825.9
	Private entity	-243200.9**	1713.3	-900.8	83609.1	377.8**	117.2	6.5*	-1229.0
	No regulatory authority	14217.5	372.0	28.3	125571.0***	145.4*	78.6	6.0*	-1050.0
Trades in urban market (base = no)									
	Yes	-7127.8	-424.2	29.1	11819.5	197.2***	14.3	-3.1	-3199.3
	Pseudo R2	6	17	4	6	18	17	22	6
	N	1588	1623	1623	1623	1623	1623	360	197

Differences found to be statistically significant are indicated by level: * p<0.1, ** p<0.05, *** p<0.01

Survey results: input suppliers & traders

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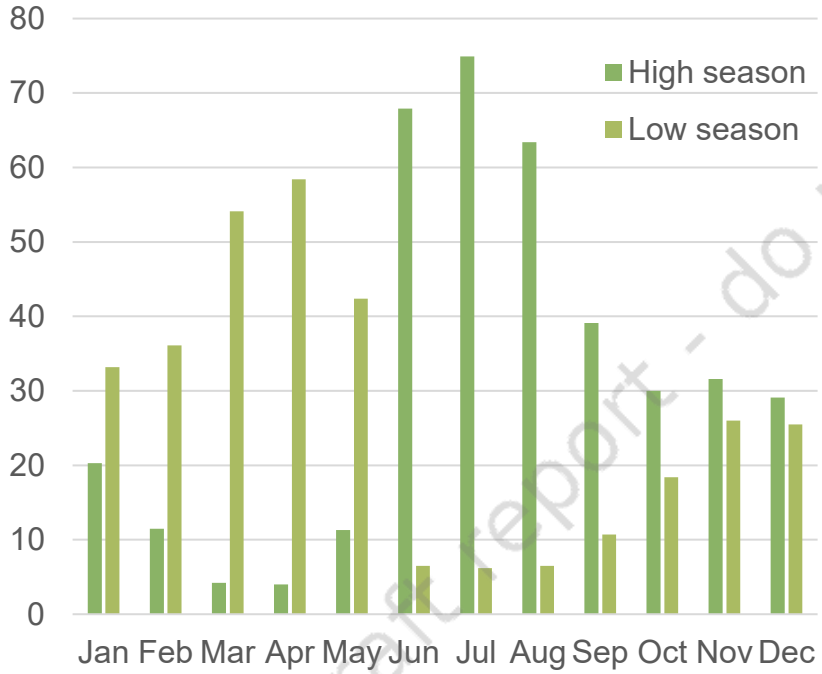
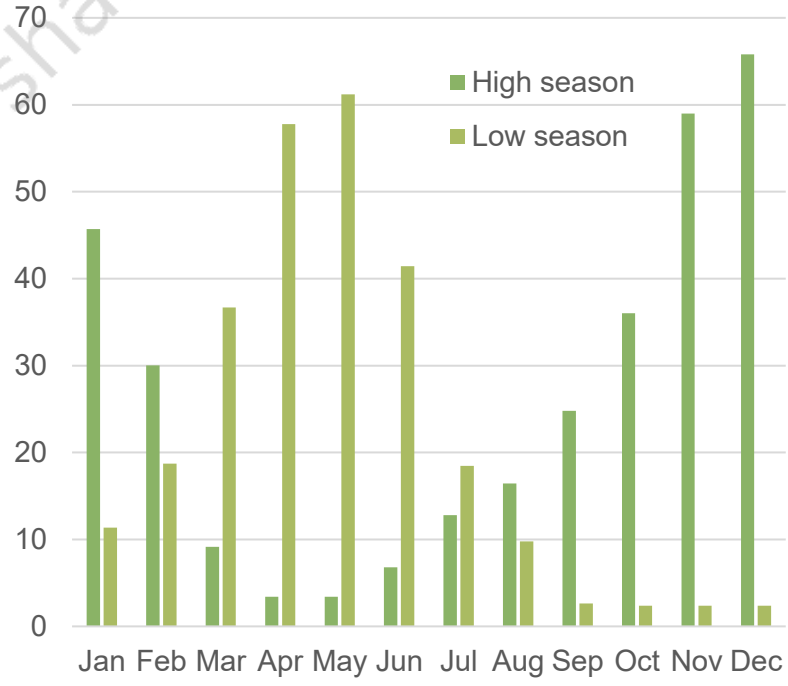
Seasonal patterns of production and consumption



High and low season months for business for agricultural input suppliers (% of responses)



High and low season months for business for vegetable traders (% of responses)

Survey results: Input supplier survey

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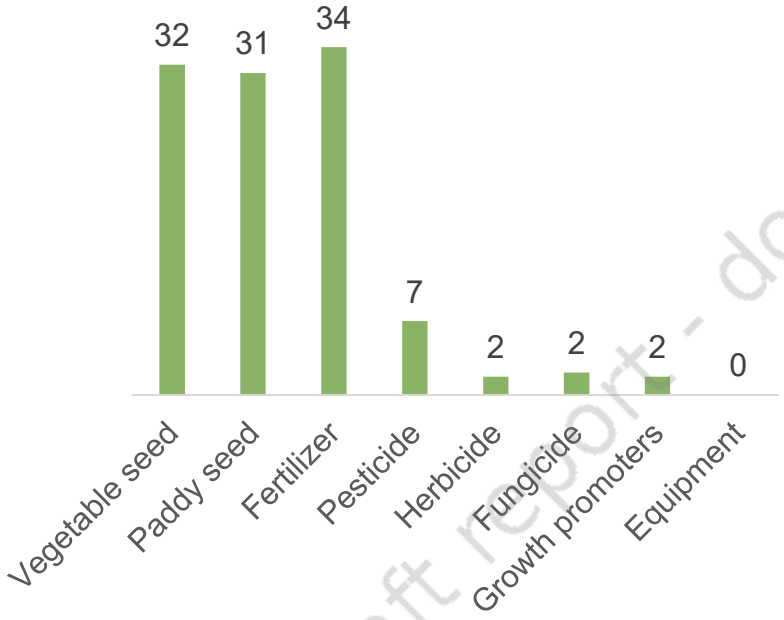
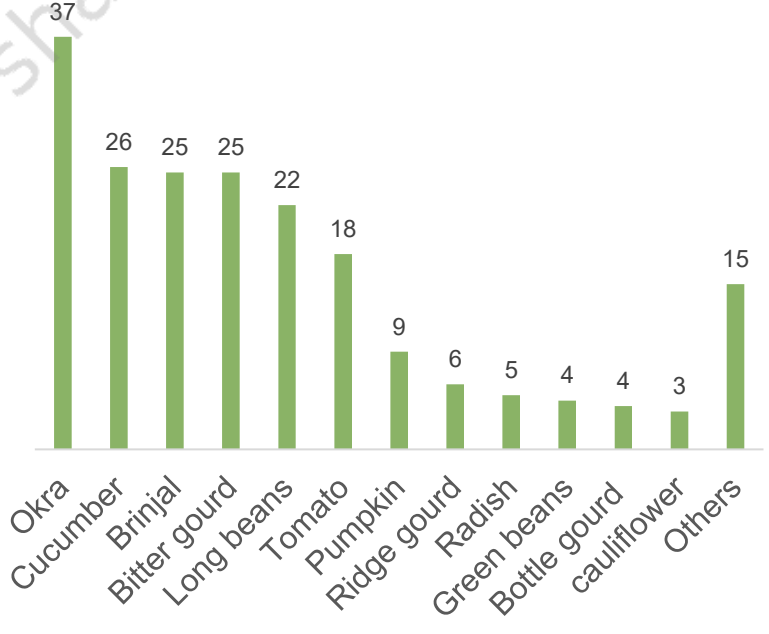
Types of inputs and seed sold during input suppliers' most recent transaction



Type of inputs during input suppliers most recent transaction (% of respondents)



Type of vegetable seed sold during input suppliers most recent transaction (% of respondents)

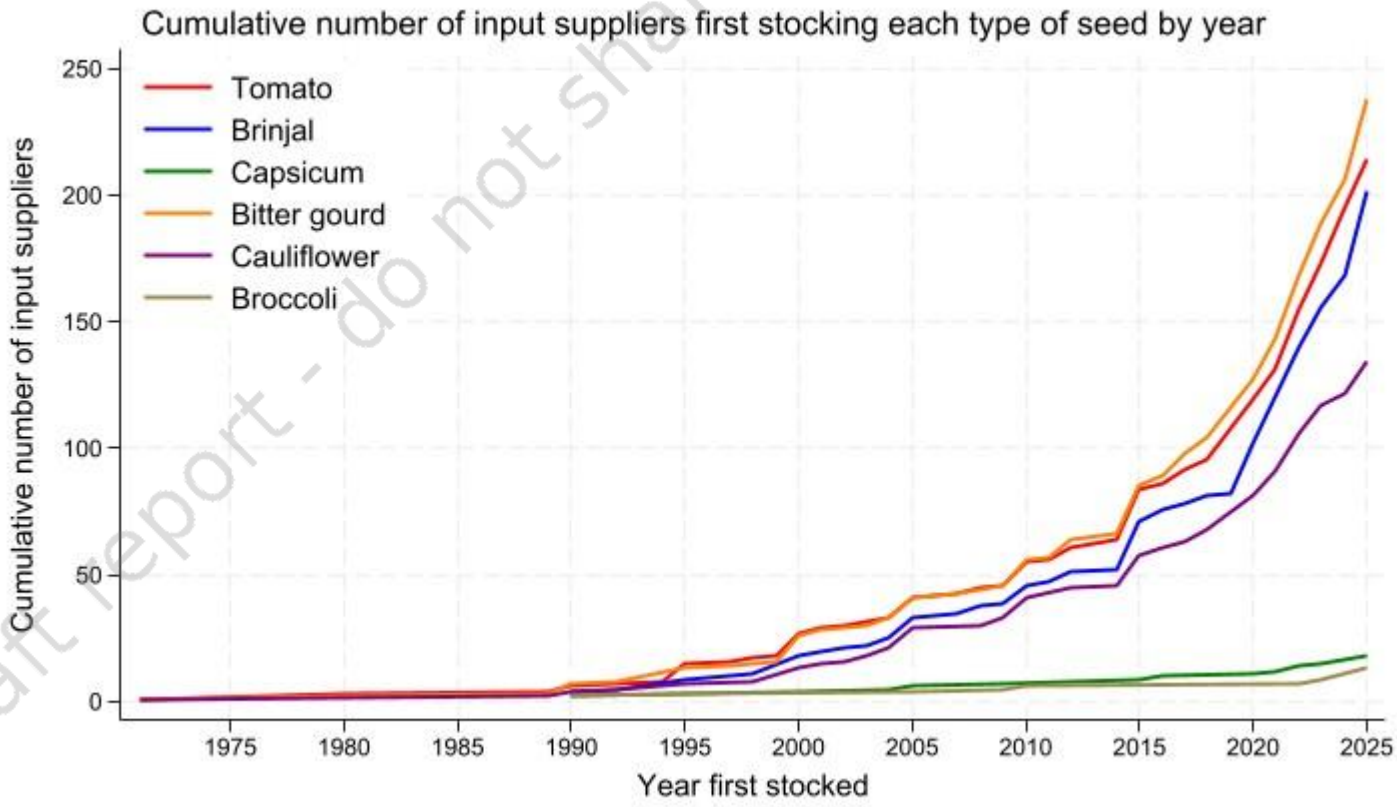
Survey results: Input supplier survey

Working with: MICHIGAN STATE UNIVERSITY · EGERTON UNIVERSITY · INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE (IFPRI)

Successive waves of commoditization in the diffusion of new vegetable crops

(first tomato & bitter gourd; then brinjal; then cauliflower; then capsicum/broccoli)

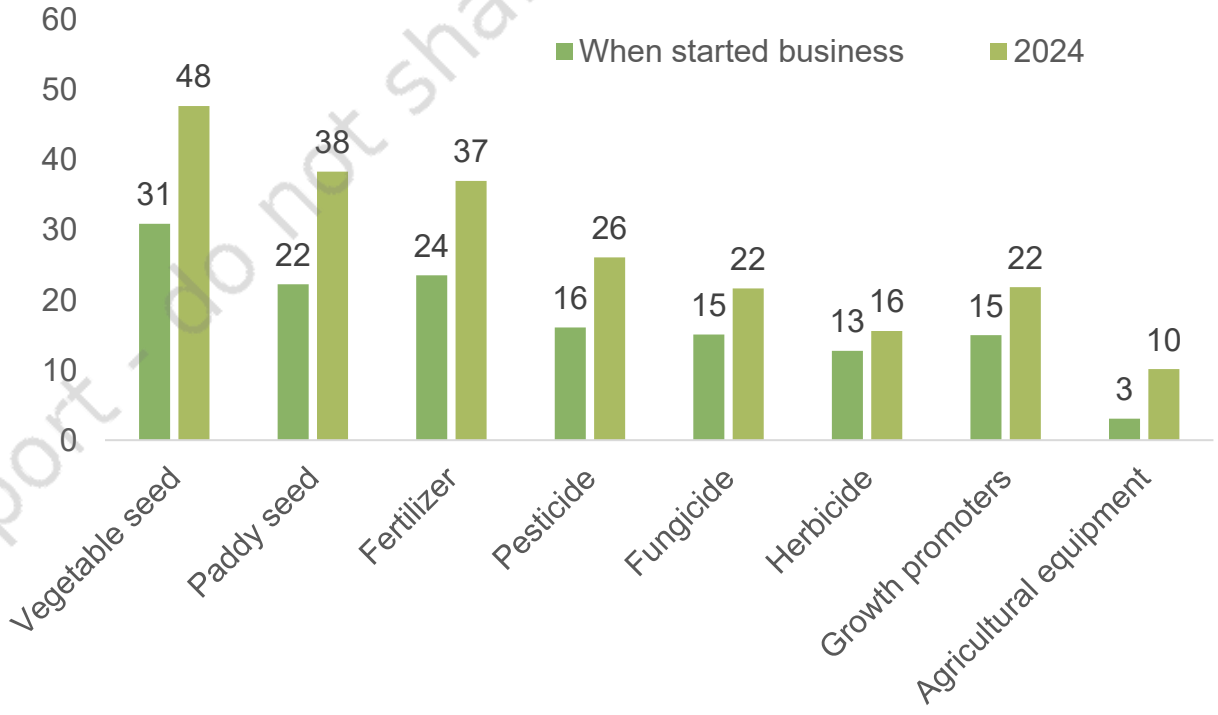
Vast majority of vegetable seeds sold are hybrid varieties



Survey results: Input supplier survey

Working with: MICHIGAN STATE UNIVERSITY · EGERTON UNIVERSITY · INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE (IFPRI)

Large increase in average number of customers per day buying inputs from input supply businesses over lifespan of business from start until present



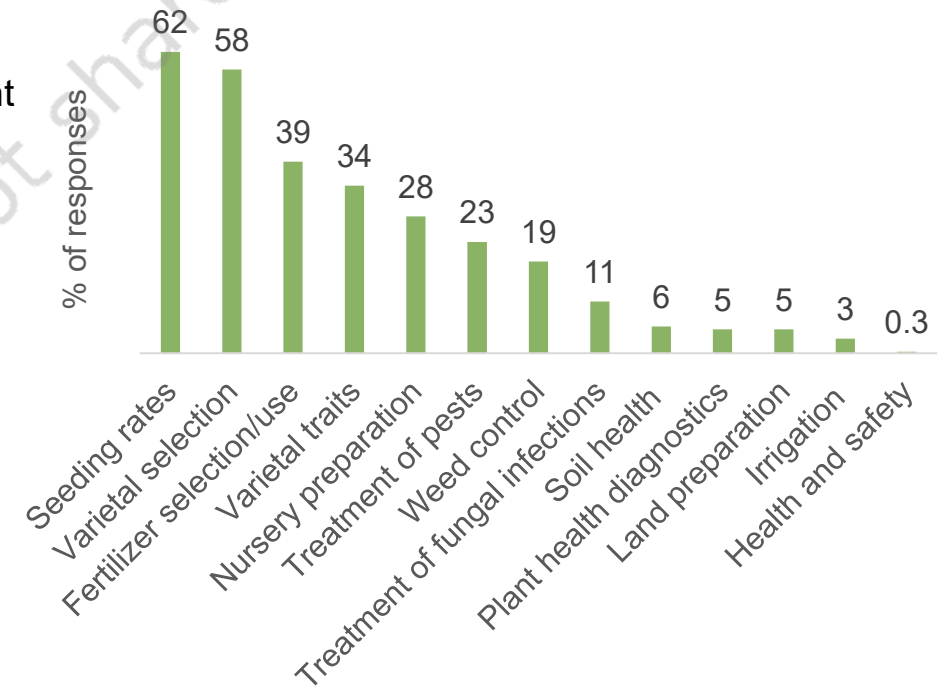
Average number of customers purchasing inputs from input suppliers per day (conditional on selling input type), when started business and in 2024

Survey results: Input supplier survey

Working with: RIMISP, Michigan State University, Egerton University, IFPRI – International Food Policy Research Institute

Input supplier's support services to farmers are mainly informational

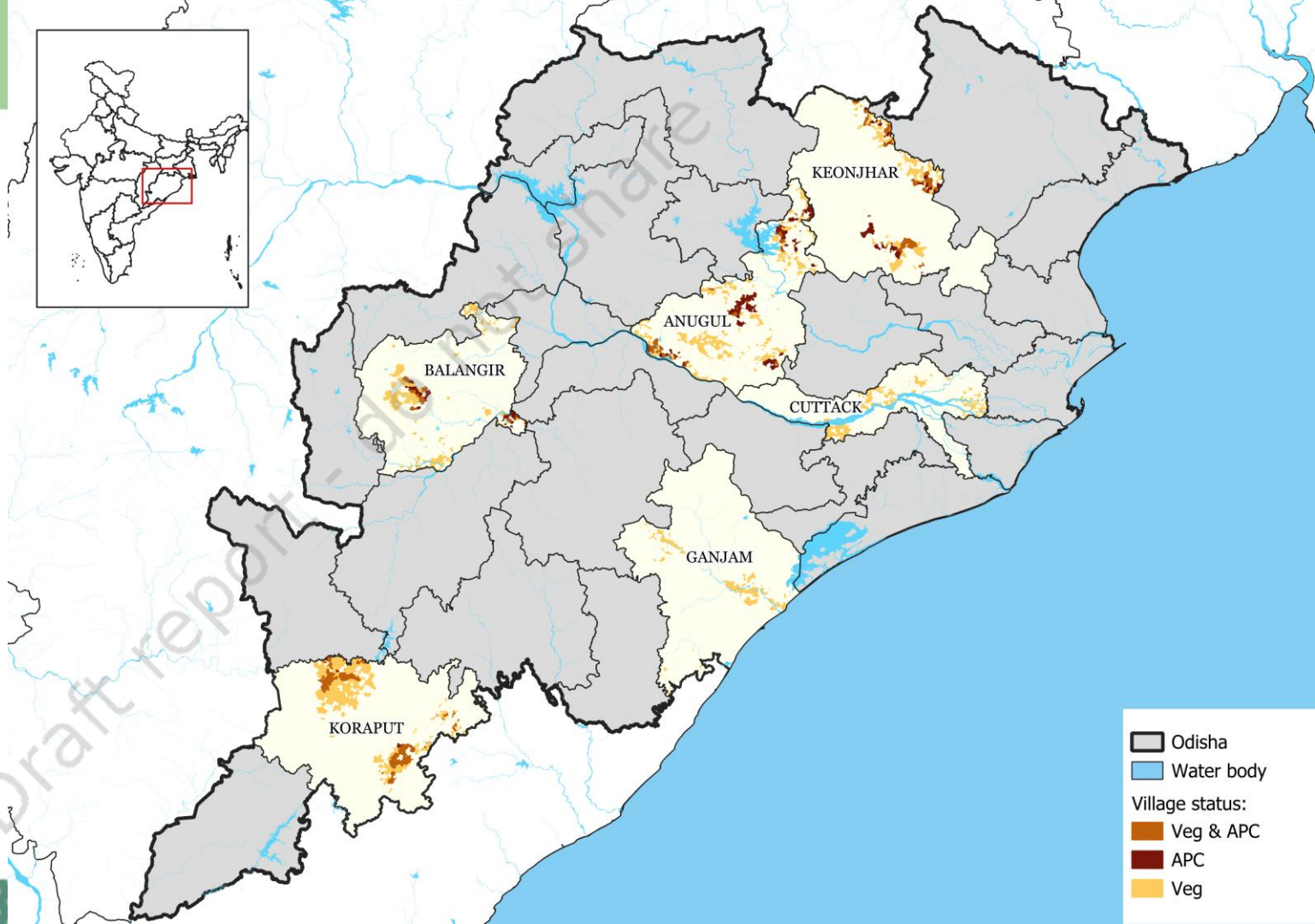
- 48% of customers asked for advice during most recent transaction
- 52% of input suppliers offered advice during most recent transaction
- Only 7% of input suppliers sell agricultural equipment, among which: 77% backpack sprayers; 7% insect traps, 7% plastic mulch, 7% water pumps, 5% drip irrigation tubing
- Conditional on selling agricultural equipment, 24% of input suppliers provide support to customers for installing/ or setting up equipment
- Conditional on selling agricultural equipment, 22% of input suppliers provide additional services for a fee, among which: spraying crops 7%, linking farmers to traders 7%, supplying veg seedlings to order 4%, mechanized land preparation 4%)



Type of advice offered by input suppliers to customers during most recent transaction (% of responses, conditional on giving advice)

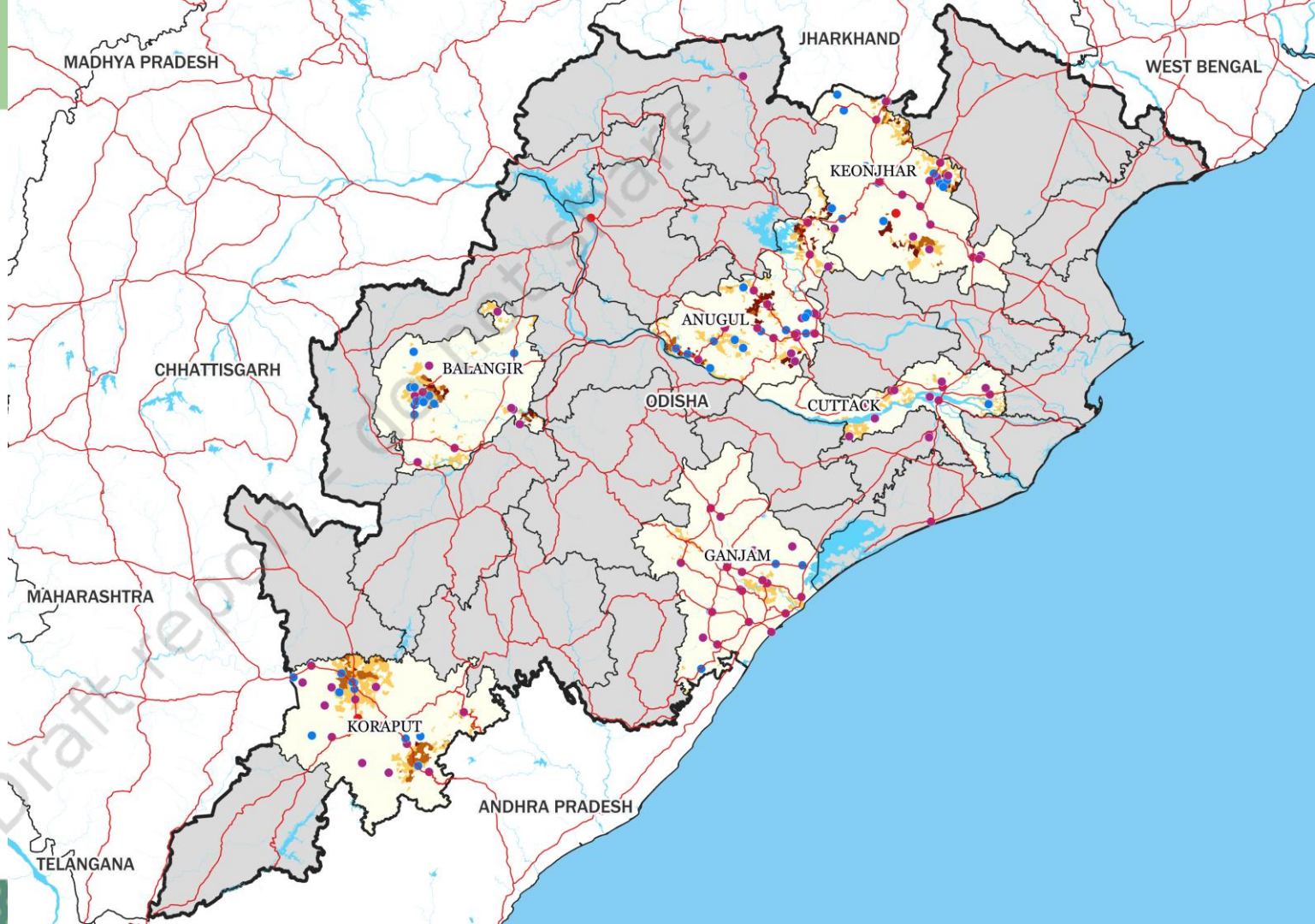
Farm sample

Map showing the location of villages selected for inclusion in the INCATA survey



Farm & market sample overlay

Map showing the location of villages and markets selected for inclusion in the INCATA survey



Survey sample design, phase 1

Working with: RIMISP, Michigan State University, Egerton University, International Food Policy Research Institute (IFPRI)

Sample design for the INCATA farm and community surveys

	High vegetable blocks	Medium vegetable blocks	Low vegetable blocks	All blocks	Additional APC villages	GRAND TOTAL
Blocks	12	6	6			
Number of villages per block	6					
Number of vegetable farmers per village	15					
Number of non-veg farmers per village	6					
Number of APC villages picked	20				10	
Number of additional vegetable farmers per APC village	10					
Sample size						
Villages	72	36	36	144	10	154
Vegetable farmers	1080	540	540	2160		2160
Non-vegetable farmers	432	216	216	864		864
Total	1512	756	756	3024		3024
Additonal APC farmers				200	100	300
GRAND TOTAL				3224		3324
Community questionnaires	154					

Survey design, phase 2

Working with: MICHIGAN STATE UNIVERSITY · EGERTON UNIVERSITY · IFPRI INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE

Administration of modules from questionnaire varies by sample substratum

- **All survey respondents receive a common set of modules**
- **Vegetable farmers in villages without managed Agricultural Production Clusters (APCs) randomly selected to receive detailed modules on: (1) vegetable production; (2) vegetable sales; (3) household income**
- **Farmers who grow rice, but no vegetables randomly selected to receive detailed modules on: (4) rice production; (5) household income, allowing for comparison with welfare outcomes as compared to vegetable farmers**
- **Vegetable farmers in villages with APCs managed receive modules on (6) vegetable production & APCs**

Stratum	**Veg farmers (non-APC villages)**			**Rice farmers**		**Veg farmers (APC villages)**
N	**2160**			**864**		**300**
Substratum	1. Non-APC vegetable farmers **production**	2. Non-APC vegetable farmers **sales**	3. Non-APC vegetable farmers **income**	4. Rice farmers **production**	5. Rice farmers **income**	6. APC vegetable farmers **production**
N	720	720	720	432	432	300
Cover sheet	Yes	Yes	Yes	Yes	Yes	Yes
A1 Respondent details	Yes	Yes	Yes	Yes	Yes	Yes
B2 Other veg-related	Yes	Yes	Yes	No	No	Yes
B2B_APC Cluster	No	No	No	No	No	Yes
B2 Veg cultivation history	Yes	Yes	Yes	No	No	Yes
B3 Transformation	Yes	Yes	Yes	No	No	Yes
B4 Tech transformation	Yes	Yes	Yes	No	No	Yes
C1 Land Roster	Yes	Yes	Yes	Yes	Yes	Yes
C3a Veg cropping & sales	Yes	No	No	No	No	Yes
C3b Veg crop establishment	Yes	No	No	No	No	Yes
C4 Veg inputs	Yes	No	No	No	No	Yes
C5 Veg labor & mech	Yes	No	No	No	No	Yes
C6a Rice cropping & sales	No	No	No	Yes	No	No
C6b rice crop establishment	No	No	No	Yes	No	No
C7 Rice inputs	No	No	No	Yes	No	No
C8 Rice labor & mech	No	No	No	Yes	No	No
D0 Whole farm income	No	No	Yes	No	Yes	No
D1 Recent sale buyer	No	Yes	No	No	No	No
D2 Recent sale details	No	Yes	No	No	No	No
D5 Recent sale transport	No	Yes	No	No	No	No
F2 Credit	Yes	Yes	Yes	Yes	Yes	Yes
H1 Off-farm work	No	No	Yes	No	Yes	No
H2 Self-employment	No	No	Yes	No	Yes	No
H3 Transfers & remittances	No	No	Yes	No	Yes	No
K1 Assets	Yes	Yes	Yes	Yes	Yes	Yes
K2 Assets	Yes	Yes	Yes	Yes	Yes	Yes
L Shocks	Yes	Yes	Yes	Yes	Yes	Yes
N Dietary diversity	No	No	Yes	No	Yes	Yes
Number of modules	**15**	**14**	**16**	**11**	**12**	**17**

Survey design, phase 2

Working with: Michigan State University · Egerton University · International Food Policy Research Institute (IFPRI)

Outline of stacked survey questionnaire for farms

Module	Section / Module title	Module	Section / Module title
Cover	Consent	C10	Whole farm income
A	Respondent details	D1	Most recent veg sale (buyer profile)
B1	Vegetable related businesses	D2	Most recent veg sale transaction details
B2	Vegetable cultivation history	D3	Most recent veg sale transport
B3	Transformation	F	Credit
B4	Technology adoption	H1	Off-farm work
B5	APC cluster membership	H2	Self-employment
C1	Plot roster	H3	Transfers & remittances
C2	Main vegetable harvest & sales	K1	Household assets
C3	Main vegetable crop establishment	K2	Housing quality & access to programs
C4	Main vegetable production inputs	L	Shocks
C5	Main vegetable labor & machinery use	M	Dietary diversity
C6	Rice cropping and sales		
C7	Rice crop establishment		
C8	Rice production inputs		
C9	Rice labor & machinery use		

Survey design, phase 2

Working with: Michigan State University, Egerton University, International Food Policy Research Institute

Outline of community survey questionnaire

Module	Section / Module title
Cover	Consent/cover sheet
A	General village information
B	Changes in the community over time
C	Agriculture
D1&2	Irrigation access
E	Weather shocks
F	Vegetable marketing
G	Access to infrastructure
H	Government programs
I	Institutions

Survey design, phase 2

Farm survey implementation timeline:

Launched in November to coincide with peak vegetable production season to aid accurate recall

- **November 12-14: House listing and community survey training**
- **November 16-28 House listing and community survey implementation**
- **November 19-24: Farm survey training**
- **November 24 - December 31: Farm survey implementation**

Qualitative studies

Working with: RIMISP, Michigan State University, Egerton University, IFPRI International Food Policy Research Institute

Study 1: Characteristics, performance and inclusivity of spontaneous and organized vegetable clusters in Odisha (for completion Jan 2025)

- Cofinanced by CGIAR gender and social inclusion accelerator
- The objective of this study is to conduct at least 6 comparative case studies of spontaneous and organized (e.g., APC) vegetable clusters in Odisha
- The case studies will compare the extent to which formation of spontaneous and organized vegetable clusters has resulted in inclusive (or otherwise) outcomes for the participants, taking into account markers of identity including gender, indigeneity, caste, and class, and the nature and scale of benefits (or disbenefits, risks) arising for cluster participation.
- The study will address variations in inclusivity and performance within spontaneous and organized clusters and will be primarily qualitative in nature. The deliverable will be a working paper manuscript, due January 2025
- IFPRI has contracted two consultants: Professor Mohanty, Department of Sociology, Pondicherry University and Assistant Professor Papesh Lenka, Department of Sociology, Utkal University who will complete the study together

Qualitative studies

Study 2: The emergence and evolution of vegetable markets: Case studies from Odisha (for completion Jan 2025)

- Commissioned by IFPRI and financed by RIMISP
- The objective of this consultancy is to conduct a set of 6 case studies of markets in Odisha
- INCATA survey work indicates that markets emerge and evolve in different ways. Some grow in size and importance, while others shrink or cease to exist. Some markets emerge, split or close due to state relocation policies. These market dynamics have implications for the structure, conduct and performance of vegetable markets in the state. Our knowledge of these market dynamics and their drivers is currently limited.
- The consultant will work with IFPRI to develop and test, using qualitative data, a set of hypotheses around the emergence and evolution of markets and the implications for the structure, conduct and performance of markets.
- Additionally, the consultant will conduct approximately 20 semi-structured interviews with women traders operating in selected markets, and 10 with men (for comparison), to explore challenges or barriers that they encounter in the operation of their trading enterprises.
- The deliverable is a working paper manuscript, due January 2025. Dr. Sukanya Basu, School of Climate Change and Sustainability, Azim Premji University, has been contracted to complete the study.

Preliminary conclusions

- Markets are critical to value chain and cluster performance and growth; Markets in Odisha, and are dynamic & inclusive (particularly for retailers and suppliers), but underserved in terms of basic amenities

- Women and marginalized groups participate actively in vegetable value chains but often on less favorable terms than men/non-marginalized groups – entry points for seeking ways to 'level the playing field'

- Clusters of cSSPs & Hidden-Middle MSMEs (traders, logistics, agro-dealers) are developing rapidly; crucial factor an inclusive transformation – some spontaneous, others catalyzed through intervention

- Beyond the direct services of intermediation, input suppliers and traders provide some informational and other services to farmers in "symbiosis", but scope to do more and production commercializes and specializes further

INCATA: Linked Farms and Enterprises for Inclusive Agricultural Transformation in Africa and Asia

INCATA Project: Preliminary results from Odisha, India

Work performed by IFPRI, Michigan State University, Tegemeo Institute and RIMISP.

November, 2025

RIMISP
Centro Latinoamericano para el Desarrollo Rural

PPT Deck prepared by IFPRI