

## AGRICULTURAL VALUE CHAINS IN INDIA

Ensuring Competitiveness, Inclusiveness, Sustainability, Scalability, and Improved Finance

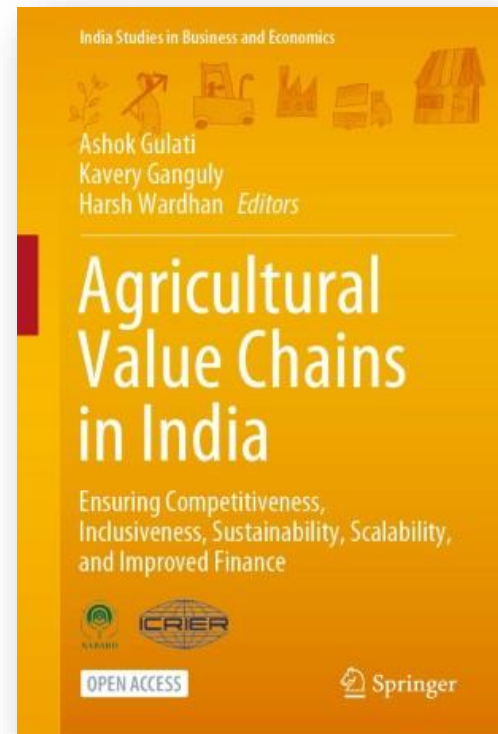
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### Introduction

The Indian food basket has been increasingly diversifying towards high value, protein and nutrition rich foods such as fruits and vegetables, milk, eggs, meat, and fish. Changing consumption preferences as a result of increasing incomes, rising population, and urbanization together with higher global demand have ushered in a demand-driven structural change in Indian agriculture. The fast-developing high value agricultural markets provide immense opportunity to India's smallholders who constitute 86.1% of total farm holdings. Dairy and poultry have been exemplary in delivering inclusive growth. Despite being a smallholder economy, India has become self-sufficient in food production and is a leading producer of a number of agricultural commodities (Table 1). However, this record level of production has not been always accompanied by commensurate increase in farmers' income. Agricultural value chains in India are subject to high fragmentation and intermediation, resulting in substantial losses in quantity and quality of produce, limited processing capacities, and high price volatility. Agricultural policies in India have been primarily cereal centric, focused on augmenting production, without giving due attention to development of efficient value chains. Intensive cultivation practices have led to environmental degradation including fast-depleting water resources and soil contamination due to unabated use of fertilizers and agrochemicals. With a diversifying production basket, policies should be aimed at holistic development of value chains.

### Scope and Methodology

This book presents a comprehensive analysis of selected agricultural value chains across major producing regions in India using the conceptual framework of competitiveness, inclusiveness, sustainability, scalability (CISS) and access to finance (F).



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**Table 1: List of commodities studied and their basic statistics**

Commodity Group	Commodity	Production (MMT)
Vegetables	Tomato	19.8 (2)
	Onion	22.8 (2)
	Potato	49.1 (2)
Fruits	Banana	30.6 (1)
	Mango	20.9 (1)
	Grapes	3 (7)
	Pomegranate	2.8 (1)
Dairy	Milk	176.5 (1)
Poultry	Eggs (billion nos.)	96 (3)
	Chicken meat	3.7 (7)
Pulses	Tur/Pigeon Pea	4.2 (1)
	Gram	10.2 (1)

Source: Horticulture Division (2020), DES (2020), DoAH&D, and MoSPI (2020)

Note: Figure in parenthesis is India's rank in global production

The book is based on a combination of secondary data analysis, primary field visits, and discussions with key players in each of the value chains. It presents some useful insights for policymaking in terms of what more needs to be done to make agricultural value chains more competitive, inclusive, sustainable and scalable.

- **Competitiveness:** Measured in terms of international competitiveness using Nominal Protection Co-efficient (NPC) and domestic competitiveness using farmer's share in consumer rupee.
- **Inclusiveness:** Analyzed in terms of participation of small & marginal farmers in production, access to markets, and logistics.
- **Sustainability:** Assessed in terms of financial (profitability) and environmental sustainability of the value chains.
- **Scalability:** Measured in terms of area expansion and productivity gains, expansion of exports and value addition, and its replicability across states.
- **Access to Finance:** Studying the financing mechanism available to the value chain participants, the gaps, and potential of innovative financing methods.

### Technology, Markets and Institutions Driving Agri-Value Chains

Technological breakthrough has been instrumental in developing agricultural value chains. While introduction of cross breed technology, artificial insemination, among others played an important role in transformation of Indian dairying, the poultry sector benefited from import of improved varieties of fowls. Thompson seedless cultivar helped enhance the quality and quantity of production of grapes. Tissue culture enhanced productivity of pomegranate and banana. Adoption of ultra-density planting and micro irrigation improved mango productivity significantly.

Institutions such as farmer collectives have ensured successful farmer-market linkages. Success of the Indian dairy sector is ascribed to the pioneering efforts of the co-operatives, particularly Amul, followed by the private sector. Grapes value chain led by Mahagrapes; a producer company was successful in linking small grape growers to export markets. Integrator-led poultry sector brought about phenomenal gains to the small poultry growers in terms of

risk management, backend support and assured markets. Commodities like tomato, onion, potato, mango, banana, and pulses are yet to witness any such significant institutional impact. However, the Operation Greens scheme launched in 2018 for TOP (tomato, onion and potato) and further extended to include 22 perishables aims at developing efficient and inclusive value chains for the same.

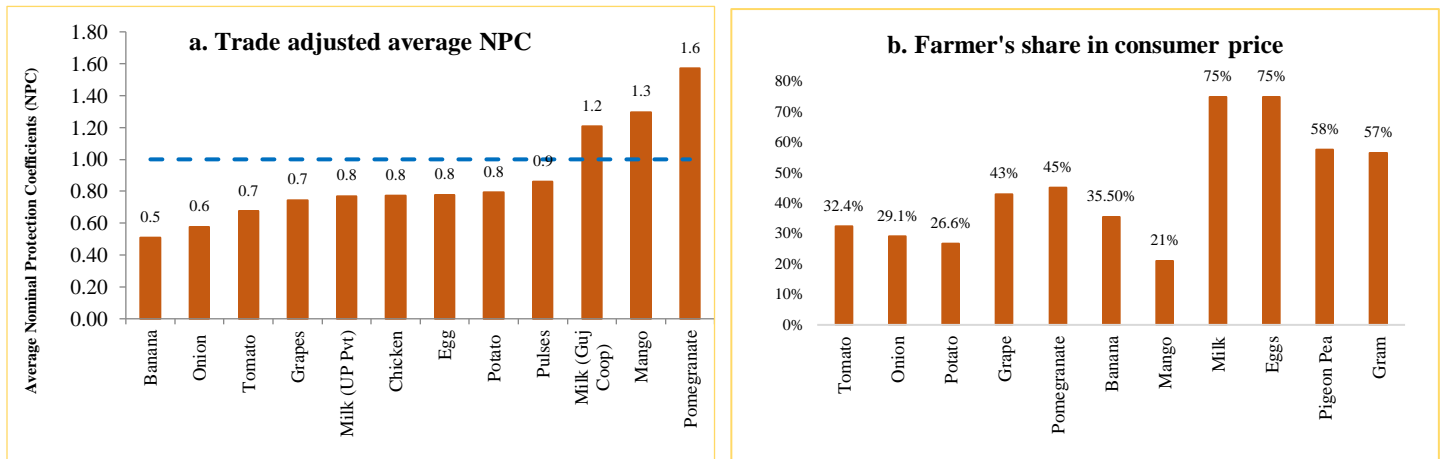
Markets have played an important role in the success of dairy co-operatives, connecting the smallest milk producer to urban markets; poultry growers to organized markets; and grapes cultivators to export markets. However, similar market linkages have not been possible in case of banana and mango. In case of tomatoes, onions, potatoes and pulses, weak market linkages explain the extreme price volatilities. Success of contract farming in vegetables is limited but offer important lessons that can help strengthen direct farmer-market linkages. On the other hand, government backed price support and procurement have not always worked in favor of pulses farmers, when prices drop below MSP and farmers are forced to sell at losses. Indian agricultural markets have been admittedly imperfect, influenced by frequent central and state government interventions in form of export bans and MEP, mostly seen as unambiguous consumer bias; as well as stocking limits and dual levy of market fees in APMC mandis.

### Key Findings

#### *Competitiveness*

NPC values were estimated for the period 2002-03 and 2017-18, and based on average NPC values, all commodities except pomegranate, mango and milk (co-operative model), were found to be export competitive (Fig. 1a). However, frequent distortions in Indian trade policies led to substantial fluctuations in actual exports. In terms of domestic competitiveness, farmer's share in consumer rupee for fruits and vegetables were found to be abysmally low, ranging from 26.6% for potato to 45% for pomegranates. Dairy co-operative and grape farmers enjoyed a much higher share of about 75%. For pulses, farmer's share was 58% for tur and 57% for gram (Fig. 1b).

**Fig. 1: Competitiveness of value chains**



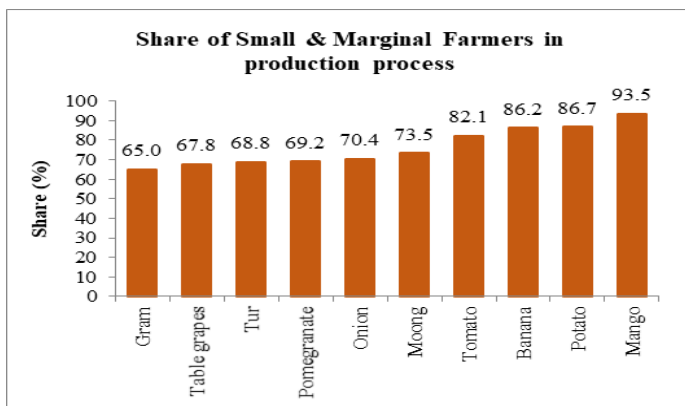
Source: Value chain studies

Note: For pulses, average NPC value is for gram (kabuli chana) between 2004–05 and 2013–14

### Inclusiveness

Nearly 70% of farmers growing fruits and vegetables are small and marginal, who primarily trade in APMC markets (Fig. 2). By way of participation, these markets are inclusive, but farmers hardly have any role in price determination due to their low bargaining power. Contract farming models of McCain and Pepsi for potato and Jain Irrigation for onion have benefited participating small and marginal farmers. However, there has been an increasing preference for large farmers and such impediments can be overcome by organizing the smallholders to form FPOs.

**Fig. 2: Share of small and marginal farmers in production process of selected commodities**



Source: Agricultural Census 2015-16

In case of grapes and pomegranates, traceability through *Grapenet* and *Anarnet* has enabled the participation of farmers, yet inclusiveness of grapes in terms of export opportunities is much stronger than pomegranate. Farmers in the mango value chain have limited role in price

determination. While dairy co-operatives have been most inclusive, poultry sector has attracted large and small farmers alike. Pulses, being less water intensive and with little need for crop care are suitable for cultivation by resource poor farmers.

### Sustainability

Financial sustainability depends on the perishability and seasonality of the crop, which affect farm incomes. TOP and pulses are extremely price sensitive and driven by traditional marketing practices. Bananas, mangoes, grapes and pomegranates are profitable, but require large investments. The financial viability of dairy co-operatives is a matter of concern as many dairy co-operatives have accumulated losses primarily because of governance issues. Indian dairying faces significant fodder shortage which further threatens the financial sustainability of the sector. For poultry sector too, the availability of high-quality and affordable feed is critical for financial sustainability. However, it is environmentally efficient compared to other segments of the livestock sector, but challenged by frequent outbreaks of Avian Influenza. Dairying is a huge contributor to greenhouse gas (GHG) emissions and also requires substantial quantity of water. All fruits and vegetables, except bananas, are non-water guzzlers, and so are pulses, and hence, are environmentally sustainable.

### Scalability

Scalability of TOP comes more from increase in yield levels rather than increase in area. However, scalability of onion can be enhanced further through increase in exports.

Production of grapes and pomegranates is scalable vertically (economies of scale) given these crops are confined to smaller regions due to climatic conditions. Bananas and mangoes are grown throughout India. In case of milk, artificial insemination and use of sex sorted semen contributed towards the increase in productivity of in-milk animals. Scaling up of poultry faces challenges due to inadequate infrastructure, inefficient marketing linkages and feed price instability. Pulses production can be increased in states with higher yield and low production levels.

### *Access to Finance*

Value chain participants such as farmers, traders, processors, exporters, and retailers, access both formal and informal sources of finance. About 80% of TOP farmers depend on informal sources of credit from money lenders, friends, and relatives attracting monthly interest rate of (2-5)%. Besides formal sources of credit through commercial banks, co-operative banks, etc., there are government schemes, subsidies, price support and interest subvention schemes for farmers. Several government schemes extend financial support towards development of commodity value chains including SAMPADA yojana, MIDH scheme, subsidies from NHB and APEDA. While financing of dairy co-operatives has been possible with support from Government, NCDC, NDDDB, World Bank and NABARD, similar benefits are not available to the private sector. For pulses, milling, processing and marketing of pulses is financed by stakeholders through bank loans and/or personal capital.

## **Key Policy Recommendations**

Policy recommendations for strengthening the structure and functioning of value chains in India can be categorized under four broad heads:

### *Technology*

- Strategic investment for accessing and disseminating technology, including investing 1% of agri-GDP.
- Government acquisition and scaling up of vital agricultural technologies from both private and foreign R&D in an affordable and inclusive manner.
- Recognizing farm level research and technology in preserving seed varieties and germplasm.

### *Markets*

- Nation-wide unified marketing fee structure applicable to all APMCs, on lines of GST.
- Support state governments in integrated development of value chain through revised buffer stocking norms, procurement by private players, and acreage-based payment (income support) tilted in favour of small and marginal farmers.
- Avail e-NWRS and engage FPOs to promote integrated pan-India supply chains in agriculture marketing.
- Relaunch/pilot futures market, especially for perishables for higher price discovery and improved price risk management.

### *Institutions*

- Intra-government co-ordination and consultation for mobilizing agri-policy reform, and private sector investment in agricultural value chains.
- Reform land lease markets for consolidation of land to create economies of scale in production, aggregation, storage, and value addition in high value agriculture.
- Leverage farmers' collectives/organizations (FPOs, co-operatives, etc.) for promoting aggregation at farm level through cheaper and easier credit, and access to common infrastructure and marketing facilities.
- Adopt globally accepted norms of food safety and quality standards for all agriculture produce.
- Create a multi-agency centre (MAC), drawing upon resources from various ministries and bodies for building value chains.

### *Finance*

- Investment policy to promote commodity value chains, in which India has a competitive advantage.
- New-generation NBFCs (Fin-Tech) to enable institutional credit flow to farmers, co-operatives and FPOs.
- Dedicated agriculture equity investment vehicle, targeting start-ups, and growth stage enterprises seeking to build value chains.
- Market oriented hedging products like collateral financing, futures contracts, and context specific products to provide risk management framework.

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