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Linking Farmers to Markets for High-Value Agricultural Commodities

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Abstract

Growing demand for high-value food commodities is opening up opportunities for farmers, especially smallholders to diversify towards commodities that have strong potential for higher returns to land, labour and capital. But, there is an apprehension about the capability of smallholders to participate in the market-oriented production due to their lack of access to markets, capital, inputs, and technology and extension services. In this paper, possibilities have been explored of linking smallholders to markets through such institutions as cooperatives, growers' associations and contract farming that reduce marketing and transaction costs and alleviate some production constraints. Evidence has shown that smallholders do participate and make a sizeable contribution to the production of high-value food commodities, but their links to markets are not strong. Though market institutions like cooperatives, contract farming and growers' associations do not altogether ignore smallholders, some policy support is imperative to strengthen their linkages with the markets.

1. Introduction

Market liberalization and globalization are causing a transformation in agriculture and agri-food markets in India. Food basket is changing towards high-value food products like fruits, vegetables and animal products, and in response, the agricultural production portfolio is diversifying. Simultaneously, food procurement and distribution system is also witnessing institutional innovations like contract farming, producers' associations, cooperatives and supermarkets. These changes are creating opportunities as well as challenges for farmers. They are expected to benefit from diversification into high-value commodities that have a strong potential for higher returns to land, labour and capital. Institutional innovations in marketing enhance their access

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to markets, quality inputs, technology, information, and services, which eventually lead to improvement in productivity and reduction in marketing and transaction costs. Nevertheless, Indian agriculture is dominated by smallholders and there is an apprehension whether smallholders can benefit from such innovations. Often, agri-business firms prefer contracts with those farmers who can fulfill their quantitative and qualitative requirements.

In this paper, we have examined opportunities and challenges for smallholders in market-oriented production of high-value commodities, and have identified the enabling institutional and policy requirements for their participation. The paper has been organized as follows. The next section has discussed opportunities for smallholders to diversify towards high-value commodities. Section 3 has examined the status of high-value agricultural production and participation of smallholders therein. Some successful models of linking smallholders to markets have been described in Section 4. Conclusions and policy requirements for upscaling these models have been discussed in the final section.

2. Opportunities in High-value Agriculture

Growing Domestic Demand

The high-value segment of agriculture offers considerable opportunities to farmers for improvement in their livelihood. Food basket is undergoing a significant change. Table 1 shows trends in shares of different food commodities in total food expenditure for the rural and urban consumers. For rural consumers, the share of high-value food commodities (fruits, vegetables, animal products and beverages) in total food expenditure increased from 30.4 per cent in 1983 to 44.1 per cent in 2004-05. Urban consumers spend relatively more on high-value foods. In 2004-05, high-value foods accounted for 55.3 per cent of their food expenditure, up from 45.3 per cent in 1983. On the other hand, the share of food grains in rural food expenditure, during this period declined from 55.3 per cent to 38.6 per cent, and in urban food expenditure from 38.6 per cent to 29.0 per cent. Though urban consumers spend relatively more on high-value foods, their consumption in rural areas has been growing faster, indicating a tendency of convergence in the consumption pattern.

The demand for high-value food commodities is more responsive to income changes. Expenditure elasticity for high-value food products ranged from 0.80 to 1.04, and was much higher than for any other food item (Ravi and Roy, 2006). Thus, as income increases consumers spend relatively more on high-value foods.

Table 1. Shares of different food items in total food expenditure in India

(per cent)

Food items	Rural			Urban		
	1983	1993-94	2004-05	1983	1993-94	2004-05
Cereals	49.5	38.5	32.8	32.9	25.8	23.8
Pulses	5.8	6.3	5.8	5.8	5.9	5.3
Milk and milk products	11.5	15.0	15.4	15.7	17.9	18.6
Edible oil	6.2	7.0	8.4	8.2	8.0	8.1
Meat, egg and fish	4.6	5.3	6.0	6.1	6.2	6.4
Vegetables	7.2	9.6	11.1	8.4	10.0	10.5
Fruits	2.1	2.8	3.4	3.6	4.9	5.3
Sugar	4.3	4.8	4.3	4.2	4.4	3.5
Salt and spices	3.8	4.2	4.5	3.6	3.8	3.9
Beverages	5.0	6.6	8.2	11.6	13.2	14.6
Total	100.0	100.0	100.0	100.0	100.0	100.0
Share of food in total expentiture	65.6	63.2	55.0	58.7	54.7	42.5

Source: GOI (2006)

These changes in consumption pattern were driven by sustained income growth and urbanization. Between 1980-81 and 2004-05, the per capita income in India grew at about 4 per cent a year, and urban population by about 3 per cent a year. Besides, changing lifestyles, increasing entry of women in workforce, growing nuclear families, increasing use of credit cards, improvements in transport infrastructure and rise of supermarkets have also facilitated these changes. These trends have been quite robust in the recent past and are likely to continue at least for some more time, leading to a faster increase in demand for high-value food commodities. Ravi and Roy (2006) have predicted demand for high-value food products to grow at an annual rate of around 5 per cent by 2020, as against 2.5 per cent for food grains.

Expanding Global Food Markets

Globalization is creating opportunities for the export of high-value products. Evidences have indicated an accelerated flow of exports of high-value food products from developing to developed countries (Diaz-Bonilla and Recca, 2000; Aksoy, 2005). India however is not a significant player in the global trade of agricultural products. It shares only 1.2 per cent of exports and 0.8 per cent of imports. As far high-value products are concerned, India's share in world exports is 1.2 per cent for fruits and vegetables, 0.6 per cent for meat and 0.2 per cent for dairy products. India however has a considerable share (10%) in exports of commodities like mangoes and onions.

Table 2 shows the changes in composition of India's exports and imports of agricultural products. During 2001-04, rice has been found to dominate India's agricultural exports with a share of 17.7 per cent, followed by horticultural products (16.1%). Meat and meat products accounted for 5.3 per cent. Over time, the share of horticultural products has remained almost constant, while that of rice, meat and dairy products has increased substantially. On the other hand, the share of traditional export commodities (tea, coffee, cocoa and spices) has declined considerably.

India's imports of agricultural products have also increased. In 2001-04, edible oils accounted for about half of the agricultural imports, followed by horticultural products (23%) and pulses (13%). The share of dairy products, rice and wheat has fallen drastically, mainly due to improvements in their domestic production.

Table 2. Trends in exports and imports of agricultural products

Agri-products	1981-85	1986-90	1991-95	1996-2000	2001-04
	Exports				
Total agricultural exports (US $ million)	2372	2525	3567	5265	6080
Commodity shares %					
Rice	9.7	9.2	16.2	17.8	17.7
Fruits and vegetables	13.4	15.3	16.0	15.4	16.1
Coffee, tea, cocoa and spices	34.8	35.2	21.5	20.6	13.3
Wheat	0.4	0.5	1.1	1.1	6.1
Meat and meat products	3.1	2.7	3.5	4.2	5.3
Sugar	2.7	0.3	2.1	1.5	4.3
Pulses	0.1	0.3	0.7	1.5	1.4
Milk and milk products	0.1	0.1	0.2	0.4	1.0
	Imports				
Total agricultural imports (US$ million)	1629	1416	1514	3093	4489
Commodity shares %					
Edible oils	46.5	30.3	17.5	45.3	47.2
Fruits and vegetables	7.7	23.5	28.0	19.0	23.5
Pulses	4.4	16.0	11.3	6.5	13.0
Coffee, tea, cocoa and spices	1.8	1.3	1.2	1.9	3.0
Sugar	5.5	5.7	10.5	4.3	1.4
Milk and milk products	7.2	3.7	0.9	0.5	0.3
Rice	2.6	4.7	0.7	0.1	0.0
Wheat	17.8	5.2	4.1	5.4	0.0

Source: FAOSTAT (2007)

Globalization of agri-food markets though is an opportunity for the Indian farmers to participate in the global food supply chains by increasing exports, the question however is 'can Indian farmers compete in the global market'. Producer prices of commodities like milk, pig and bovine meat, eggs, bananas and grapes are lower in India than in many other countries, indicating its comparative advantage in their production (FAOSTAT, 2007). However, India loses in the international market due to (i) lack of scale economies in processing, (ii) stringent food safety and quality standards in the global trade, and their high cost of compliance, and (ii) huge protection to producers and exporters in major exporting countries.

3. Growth in High-vlaue Agriculture

Rapidly expanding demand for high-value food commodities incentivizes farmers to diversify their production portfolio towards commodities that have a strong potential for higher returns to land, labour and capital inputs. The changes in agricultural production over the past two decades are shown in Table 3. The share of high-value food commodities in the value of agricultural sector output increased from 35 per cent in TE1982-83 to 47 per cent in TE 2003-04. The changes in the production portfolio are starker at the commodity or commodity group level. During this period, the share of fruits and vegetables increased from 14 per cent to 17 per cent, of milk from 13 per cent to 18 per cent, of poultry from 1.6 per cent to 3.2 per cent and of fish from 2.6 per cent to 4.3 per cent.

There was a deceleration in the growth of most commodities, except for high-value food commodities. Between 1990-91 and 2003-04, horticulture grew at an annual rate of 5.4 per cent, much faster than that during 1980s. Poultry production experienced a consistent growth of over 6 per cent per annum. Dairy production too grew consistently at about 4 per cent per annum, despite a marginal deceleration in the latter period. Growth in fish production accelerated from 3.2 per cent during 1980s to 5.9 per cent during 1991-92 to 2003-04. These trends are much robust compared to those for rest of the agriculture. On the whole, growth in high-value segment accelerated from 4.2 per cent during 1980s to 4.8 per cent during 1990-91 to 2003-04. This provided a cushion to the agricultural growth, which otherwise would have decelerated at a higher rate.

A robust growth in high-value agriculture was facilitated by such policies, as establishment of the National Horticulture Board in 1984 to promote production, processing, marketing and exports of horticultural products. The Milk and Milk Products Order (MMPO) that restricted the private sector participation in dairy sector, was relaxed considerably in phases. Besides,

Table 3. Changes in the composition of agricultural sector

Agri-products	Share in value of output, %			Annual compound growth, %	
	TE 1982-83	TE 1992-93	TE 2003-04	1980-81 to 1990-91	1991-92 to 2003-04
Crops	**77.3**	**74.3**	**69.3**	**2.6**	**2.2**
Cereals	27.4	27.2	22.9	3.0	1.3
Rice	14.6	15.1	12.5	3.6	1.0
Wheat	7.9	8.2	7.5	3.4	2.1
Pulses	5.6	4.6	3.4	1.2	-0.2
Oilseeds	6.6	8.5	7.1	5.3	0.8
Fibres	3.4	3.3	2.7	5.3	0.8
Drugs and narcotics	1.6	1.4	1.8	1.8	5.0
Condiments and spices	2.1	2.2	2.5	4.6	3.9
Fruits and vegetables	14.0	13.5	17.3	2.7	5.4
Sugars	6.0	5.9	5.6	3.2	2.3
Livestock	**20.0**	**22.7**	**26.4**	**4.7**	**4.1**
Dairy	12.9	15.4	17.5	5.5	4.1
Poultry	1.6	2.2	3.2	6.2	6.3
Meat	1.4	1.8	1.8	5.5	2.9
Fisheries	2.6	3.0	4.3	3.2	5.9
Agricultural sector	**100.0**	**100.0**	**100.0**	**3.1**	**2.8**
High-value foods	**34.6**	**38.2**	**46.6**	**4.2**	**4.8**
Rest of agriculture	**65.4**	**61.9**	**53.5**	**2.5**	**1.4**

Source: GOI (various years)

the government also provided some fiscal incentives, such as reduction in corporate taxes and excise duties on processed foods, as a part of the economic reforms programme initiated in 1991. De-licensing of food processing industry also attracted considerable foreign direct investment (FDI), leading to a faster growth in processed food production.

Indian agriculture is dominated by smallholders; about 86 per cent farm households have landholding size of ≤2 ha. High-value agriculture is suited to smallholder production systems, as production of many high-value agricultural commodities require more labour resource and smallholders have a plenty of family labour. However, the question is whether smallholders participate in high-value agriculture. It is often argued that smallholders are constrained by lack of cpaital, inputs, technology and services, and access to markets, which may act as a barrier to their diversification towards high-value agriculture.

Table 4 shows the participation rate and contribution of smallholders in selected high-value food commodities. On an average, 15.3 per cent

Table 4. Participation of smallholders in production of high-value commodities

Category	Vegetables	Fruits	Diary
Participation rate (%)			
Small (< 2.0 ha)	15.8	5.0	41.0
Medium (2.0-4 ha)	14.8	2.7	56.7
Large (>4.0 ha)	10.4	3.0	68.5
All	15.3	4.6	44.2
Distribution of participating households (%)			
Small (< 2.0 ha)	83.5	88.4	77.4
Medium (2.0 – 4 ha)	11.9	7.1	13.7
Large (> 4.0 ha)	4.6	4.5	8.9
All	100.0	100.0	100.0
Share in area/production (%)			
Small (< 2.0 ha)	61.0	51.9	68.8
Medium (2.0 – 4 ha)	20.9	19.3	16.7
Large (> 4.0 ha)	18.1	28.8	14.5
All	100.0	100.0	100.0

Source: For fruits and vegetables, GOI (1999); for dairy, GOI (2005a).

households grow vegetables, 4.6 per cent fruits and 44.2 per cent dairy animals. Participation of smallholders in fruits and vegetables production is higher compared to any other category of landholders. However, participation of smallholders in dairying is less as compared to others.

Smallholders have a larger presence in the high-value segment; over 84 per cent vegetable growers and 88 per cent fruit growers are smallholders. They account for 61 per cent of the vegetable area and 52 per cent of the fruit area. Their presence in milk production is also considerable; over 77 per cent milk producers belong to smallholders and contribute 69 per cent to total milk production.

4. Improving Farmers' Access to Markets through Institutional Innovations

Smallholders though make a sizable contribution to high-value food production, their access to markets is constrained by scale. Their marketable surplus is small, while local markets for high-value commodities are thin and sale in distant urban markets raises transportation and marketing costs. Existing supply chains are long and are dominated by a number of intermediaries like assemblers, wholesalers, sub-wholesalers, commission agents and retailers. In the case of fruits and vegetables, farmers receive one-third to one-half of the final price (Gandhi and Namboodiri, 2002), indicating high marketing costs and margins. Birthal *et al*. (2005) have

estimated the marketing costs to be around 20 per cent of the sale price of vegetables. Marketing costs are also high in the case of milk, 15-20 per cent (Birthal *et al*. 2005; 2006).

Institutional Approaches

High marketing and transaction costs act as a barrier to farmers' participation in markets. Institutions such as cooperatives, growers' associations and contract farming are considered to reduce marketing and transaction costs and risks by providing 'markets' to the farmers at their doorsteps (Eaton and Shepherd, 2001). In this section, we have examined some successful models of such institutions.

Cooperatives

India's dairy cooperative model is one of the successful models linking farmers to markets. The first dairy cooperative was established in the Kheda district of Gujarat in 1946, primarily to save producers from exploitation by the middlemen/informal traders, and improve their bargaining strength and economies of scale in marketing. In 2004-05, there were more than 11.3 thousand village level dairy cooperative societies in India with 12.3 million members. These procured 7.3 million tonnes of milk, equivalent to 7.9 per cent of the total milk produced in the country (NDDB, 2005). Cooperatives also provide inputs, services and information to the producers-members. In recent years, some dairy cooperatives have started using information and communication technology for milk procurement and information dissemination systems to improve efficiency and transparency in marketing. Cooperatives market the milk and milk products in over 800 cities and towns through their retail outlets.

Cooperatives also exist for other products, including oilseeds, fruits and vegetables. Two important cooperatives in horticulture are Mahagrapes in Maharashtra and HOPCOMS (Horticulture Produce Cooperative Marketing and Processing Society Limited) in Karnataka. Mahagrapes is an association of grape growers' cooperative societies. It was established in 1991 to improve the grape growers access to domestic and international markets, which otherwise was difficult for individual producers or cooperative societies. It now has 16 growers' cooperatives with 2500 farmer-members.

Mahagrapes supplies inputs, technology, and extension services to farmers through cooperatives and empowers them to produce quality output conforming to food safety and quality standards of the importing countries. Cooperatives associated with Mahagrapes have refrigerated transport and cold storage facilities, for which cooperatives charge a fixed amount, on per kg basis from the farmers.

In 2003-04, Mahagrapes exported grapes worth US$ 2.2 million, mainly to UK, Netherlands and Middle East countries. Mahagrapes does not retain the profits it earns. It charges a fixed amount from farmers, on per kg basis, to meet costs of transportation, labour and other activities. The profits are passed on to the farmers. The net revenue for farmer members was about 60 per cent higher than those selling in the open market (Bakshi *et al*., 2006).

Established by the state government in 1959 in Bangalore, HOPCOMS now secures its supplies from about 12,000 framer-members through its procurement centres. It markets about 500 tonnes of vegetables daily through 504 retail outlets. It also has 5 cold storages and one processing unit. The Society also has outlets for the supply of inputs to the farmers.

Growers' Associations

Growers' associations are informal cooperatives managed by the farmers themselves. SAFAL — a village level association promoted by the Mother Dairy Fruits and Vegetables Limited (MDFVL), has been quite successful in linking fruit and vegetable farmers to markets. SAFAL was established in 1988 to cater to the growing demand for fruits and vegetables in the metropolitan city of Delhi. At present, there are 250 SAFAL associations with about 20,000 farmer-members in the country.

MDFVL provides technical support to these associations in preparation of crop calendar and showing schedules to get the desired supply on a regular basis. The firm also provides inputs like quality seeds, bio-pesticides and bio-fertilizers, and extension services to the producer-members. The MDFVL is an ISO-9002 and HACCP certified firm. Quality standards for each fruit and vegetable are defined in respect of size, weight, colour and appearance, and are displayed at each SAFAL collection centre for farmers to comply with.

Daily wholesale market prices in the Delhi wholesale market serve as the base price for the producers. Farmers are paid the modal price plus a 5-10 per cent premium for quality. The firm does not share any production and price risk.

MDFVL has a 100 per cent export-oriented fruit-processing unit in Mumbai. The MDFVL markets produce in fresh, frozen and processed forms with brand name 'SAFAL'. Retailing activity in fresh fruits and vegetables is restricted to the metropolitan area of Delhi through its network of about 300 retail outlets. The processed products are meant for domestic as well as export markets. Major export destinations for SAFAL products are: Europe, USA, Australia, Middle East, Japan, Singapore and Hong Kong. In 2004, SAFAL had a turnover of about Rs1.5 billion.

Farmers have benefited from the SAFAL supply chain. A study on spinach production by Birthal and Joshi (2007) has shown that SAFAL farmers, on average, realized 78 per cent higher profits, 8 per cent higher prices and incurred 92 per cent less marketing costs over those supplying it in the open market.

There are also grower's associations for other commodities. Two notable examples include Self-Help Groups (SHGs), promoted by Appachi Cotton Company Limited in Tamil Nadu, and Agrocel Pure & Fair Cotton Growers' Associations, promoted by Agrocel Industries Limited in Gujarat.

Contract Farming

In India, contract farming is in the nascent stage, but is likely to emerge as an important form of vertical coordination with unfolding of market liberalization and globalization. Recent reforms in agricultural markets have opened up new avenues for agribusiness in India, and many a big business houses have started entering the agricultural markets, and use contract farming as a means to source their raw material requirements. Contract farming is practised in many agricultural commodities including wheat, Basmati rice, fruits, vegetables and medicinal plants, but is prominent in poultry and dairy. About 40 per cent broiler production in the country is under contract. For milk, no such estimate is available, but the private sector procures nearly 8-10 per cent of the total milk produced in the country.

The agri-business firms follow different models of contract farming, ranging from bi-partite to multi-partite agreements. A bi-partite contract is an agreement between producers and firms, which may take the form of a market specification or resource providing contract. Inclusion of other agencies by the agri-business firms to provide inputs, credit and insurance gives rise to multi-partite contracts. In India, bi-partite contracts are common in poultry. Firms provide critical inputs like day-old chicks, feed, medicines, vaccines and extension services. Poultry farmers bear the cost of labour, shed, litter, water and electricity. Farmers are provided a guaranteed remuneration in the fixed growing charges based on bodyweight of the birds. The firms lift the entire output and thus farmers are insulated against market risks.

From farmers' perspective, most important benefit of contract farming is their insulation against price risk which is very high in poultry production. Ramaswami *et al*. (2006) have shown that through contract farming farmers could shift as much as 88 per cent income risk to the firms. Another benefit is the access to interest-free credit in the form of inputs. In a study, Birthal *et al*. (2005) have estimated 58 per cent reduction in marketing and transaction costs and 13 per cent increase in net profits due to contract farming.

Tri-partite contracts are common in dairying. Firms enter in contract with a local person in the village who acts as an intermediary/facilitator between producers and firm. This reduces transaction costs of contracting with a large number of small-scale producers. Bi-partite contracts are with large dairy producers.

The intermediary (agent) also assists firm staff in dissemination/ distribution of information, inputs, services and milk payments to producer-suppliers. Price of milk is determined on the basis of its fat and SNF (solids not fat) contents, taking into consideration the prices fixed by its competitors.

Main benefit from the contract farming in milk is the reduction in marketing and transaction costs. Birthal *et al*. (2005) have shown that with contract farming farmers could save as much 92 per cent of these costs. This enabled them to earn almost twice the net revenue as compared to that by independent farmers.

ICT-enabled Supply Chains

India is witnessing a revolution in Information Communication Technology (ICT). Its applications in linking farmers to markets are on the rise. The *e-chaupal* initiative of the Indian Tobacco Company Limited (ITC) is one of such efforts. The ITC provides information on market prices, agronomic practices, inputs, weather, etc. through internet kiosks, free of charge. A farmer can sell his produce to ITC at the market price, and can also avail inputs from it, if he desires. ITC has about 6100 *e-chaupals* spread over 35000 villages, serving 3.5 million farmers in eight states.

There are several such other initiatives taken by big business houses. Some of these are : 'Hariyali Kisan Bazar' of the DCM Limited, 'Kisan Sansar' of the Tatas, 'Mahendra Shubhlabh' of Mahendras & Manhendars, etc.

Inclusion/Exclusion of Smallholders

Marketing and transaction costs are higher for smallholders. They are expected to benefit most from institutional marketing arrangements. The question however is: 'Are they included in the supply chains?' Often agri-business firms hesitate contracting with smallholders because of their small-scale and inability to comply with food and quality standards. Contracting with smallholders thus raises transaction costs (search, monitoring and enforcement) to the firm.

There is a mixed evidence regarding participation of smallholders in the coordinated marketing systems. In contract farming of spinach (Birthal and

Joshi, 2007) and gherkin (Erappa, 2006) more than 50 per cent farmers were found small landholders (d”2ha). Birthal *et al*. (2005) have reported considerable involvement of small-scale producers in contract farming of milk, but not in broiler production. In dairying, 56 per cent contract farmers had d”5 milch animals, while in broiler production, only about one-third of the contract producers had d”5000 birds/cycle. On the other hand, Kumar (2006) has found very little involvement (15%) of small landholders in crop production in Punjab.

5. Conclusions and Policy Implications

Unfolding of market liberalization and globalization is causing significant changes in agriculture and agri-food markets. Agriculture is diversifying towards high-value food commodities, and food marketing system is moving towards vertical coordination. These imply a greater need for strong linkages between production and markets.

Both, central and state governments have taken a number of steps to strengthen linkages between agriculture and agri-business. These include relaxation in regulations governing markets, fiscal incentives for food processing industry, pruning of the list of food products reserved for small-scale industry, increased availability of credit to farmers at lower interest rate, funding of contract farming schemes by institutional agencies, permission of FDI in single brand retailing, etc. But, there are a number of other issues that require policy attention.

Expanding agri-business will confront infrastructural constraints such as poor roads, transportation and storage facilities, and erratic electricity supply. Empirical evidence has shown a lower concentration of high-value agriculture in areas with poor road network (Parthasarathy Rao *et al*., 2006). In this age of information, electricity is crucial to effectively utilize information technology to retrieve and transmit information on production and post-harvest technology and management practices, prices and markets. Investment is required in public infrastructure to not only facilitate market linkages but also induce private investment in cold chains and food processing.

Expanding domestic and global food markets are accompanied by increasing demand for food safety, quality, traceability and compliance. Meeting these requirements is a big challenge for farmers, processors and exporters due to their higher initial investment on machinery and equipment, certification procedures and labelling, and monitoring and enforcement costs at the farm level.

Tax incidence on processed foods is high (15-21%), despite some reductions in recent years. In countries like UK, USA, Malaysia and

Thailand, processed foods are either exempted from taxes or attract very low taxes. In India, packaging cost is also high, ranging between 12 and 20 per cent of the total cost. High tax incidence and packaging costs raise retail prices, making products unaffordable to large masses.

Foreign direct investment (FDI) in retailing is not allowed, except in single brand. There is an apprehension that entry of multinationals would displace workers in the unorganized food retailing. Nevertheless, FDI can strengthen agribusiness supply chains, improve competitiveness in production and marketing, and enable farmers to participate in quality-driven global food chains.

Integration of smallholders on the supply chain is a major challenge. Exclusion of smallholders from the supply chain is politically unacceptable and socially undesirable. Their integration requires collectivization into cooperatives and self-help groups or intermediary contracts, which reduce transaction costs to both firm and farmers. The government should facilitate such institutors.

Production of most of the high-value agricultural commodities is capital- and information/knowledge-intensive and riskier, while smallholders lack access to capital, improved technologies, quality inputs, extension services needed for entry into the high-value segment. It is therefore essential to strengthen institutional mechanisms that improve smallholders' access to credit, insurance, technology and support services.

By amending the Agricultural Produce Market Committee Act, the Government of India has allowed agri-business firms to source raw materials directly from the farmers through contract farming. The revised Act however does not provide for any legal measures to overcome disputes arising due to breach of contract and other opportunistic tendencies. Contract farming is emerging in a big way in India, and there is all likelihood of rise of such problems in the future. Policies to facilitate transparency in contract arrangements and stringent rules to safeguard the interest of farmers as well as firms are imperative.

An enabling policy environment is essential to strengthen the supply chain and value addition. There are considerable opportunities for agri-business development. India has diverse agro-climatic conditions, offering a tremendous potential for growing a wide range of commodities round the year. It is the largest producer of milk (14.6%, 97 million tonnes), second largest producer of fruits and vegetables (9.2%, 128 million tonnes), and sixth largest producer of meat (2.3%, 6 million tonnes) in the world. It produces 40 per cent of world mangoes, 35 per cent of green peas, 29 per cent of cauliflowers, 22 per cent of bananas and 20 per cent of cashew nuts.

Demand for processed foods is expected to grow rapidly. Unfortunately, food processing industry is under-developed. Organized sector processes only 1.4 per cent of total output of fruits and vegetables, 6 per cent of poultry, 8 per cent of marine products, 13 per cent of milk and 21 per cent of buffalo meat (GOI, 2005b). The food processing policy envisions raising the level of processing to 15 per cent in the case of fruits and vegetables, 25 per cent in poultry, 20 per cent in marine products, 30 per cent in milk and 45 per cent in buffalo meat. This will require considerable investment from the private sector.

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