



Factors Affecting Competition in the Agricultural Produce Markets in India

The low incomes enjoyed by Indian farmers are partially due to the capture of the purchasing power of consumers by numerous intermediaries. Therefore, there is a need to reduce the number of intermediaries through proactive measures and methods such as “contract farming” and “direct farming.” The geographically isolated nature of markets also facilitates the phenomenon of capture by intermediaries. The situation can be remedied by an improvement in the physical connectivity of markets – better roads and rail links and by an improvement in the freight facilities on trains and trucks, especially those for small farmers. But it is even more important to improve information flows about markets to farmers. Thus, steps to reduce geographical isolation of markets for farm produce and the economic distance between the farmers and the ultimate consumer can help greatly to introduce competition in agriculture and thereby facilitate a rise in farm incomes and farm investment.

I. Background

Agriculture is an important sector in India as it employs around 60 percent of the workforce. The forward and backward linkages of this sector with industry and services are significant. Agriculture is an important source of demand as well as supply for these sectors. Therefore, the growth in prosperity of the agricultural sector should augur well not only for the rural populace but also for the rest of the economy. The approach paper to the 11th Five-Year Plan, thus, indicates that 4 percent growth in agriculture is needed to sustain 8 to 9 percent growth in the overall Gross Domestic Product (GDP)¹.

Agriculture, however, is the poorest and the least productive of these three sectors. It produces only 20 percent of the country's GDP whereas the rest is produced by only 40 percent of the work force implying that labour in agriculture has a productivity which is one-sixth of the average labour productivity in the rest of the economy. It has also been marked by remarkable stagnation and sometimes even negative growth in recent years. For example, in the period stretching from 1999 to 2005 the average rate of growth per annum of agricultural product was just 2.3 percent - far lower than the rate of growth of around 7 percent per annum for the entire economy. Three years in this period were marked by negative annual growth rates.

Many reasons have been advanced for the slow growth of the agriculture sector – lack of quality inputs, poor public infrastructure and marketing facilities and extreme pressure of population on agricultural land etc. But in this paper we shall look into these factors through the lens of

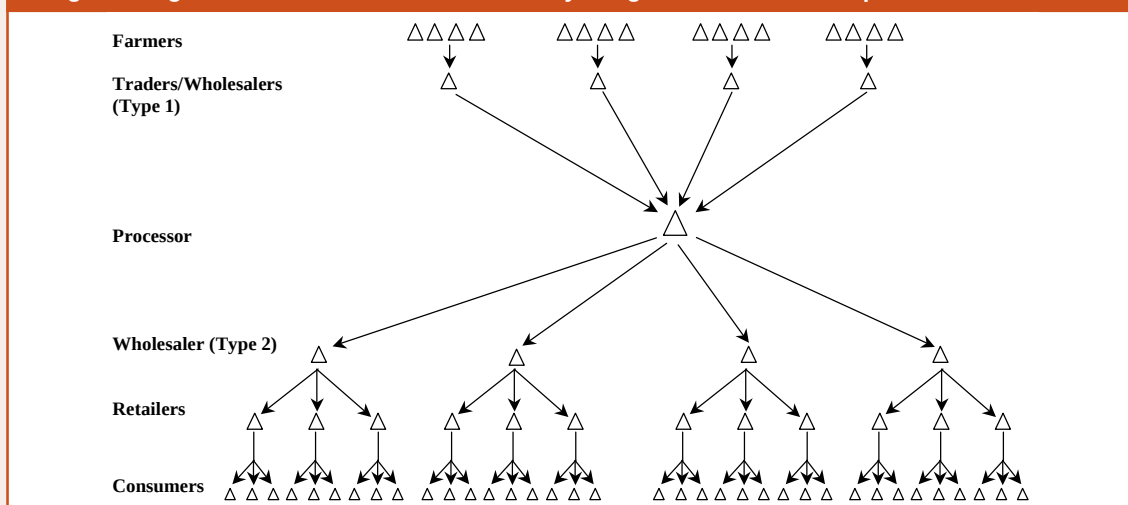
an institutional problem that has always plagued the Indian agricultural system. This is the problem of a lack of competition at the different nodal points in the delivery mechanism which takes the produce from the farmer and effects a transition through various channels before it reaches the final consumer.

Given the large number of Indian farmers and the even larger number of final consumers there is no dearth of competition among sellers at the farm gate and buyers at the retail outlets. Between the farm gate and final buyer there are intermediaries at different stages which are, however, characterised by lack of competition. This is illustrated by considering how a bottle of tomato ketchup might land up at your dining table (see Figure 1).

A rural wholesale trader who has a monopoly on the farmers selling tomatoes to him (this is referred to in economic theory as a monopsony) in turn sells them to a processor who is also a monoposonist. The processor converts tomatoes into ketchup and bottles the produce. These bottles are then sold by the processor, who acts like a monopolist in the market for tomato ketchup, to wholesalers. Each wholesaler then acts as a monopolist while selling these ketchup bottles to retailers who in turn act like monopolists or near monopolists while selling them to final consumers.

The people constituting the chain in between the farmer and the consumer are called intermediaries. By virtue of their monoposonistic/monopolistic position in the intermediary chain these intermediaries are able to earn a premium over their costs of buying and selling. As a

Figure 1: Agricultural Markets Characterised by Long Chains of Non-competitive Intermediaries



result, the farmer gets only a fraction of the consumer's expenditure on the product. Figure 2 illustrates a short chain of intermediaries characterised by competition. In this case, a higher proportion of the final consumer expenditure on the product goes to the farmer.

Given that the amount that a farmer earns per unit produce is much smaller for a long chain of non-competitive intermediaries than for a shorter chain with more competition among intermediaries, the investment that he undertakes (for fertilisers, irrigation etc) is also smaller in the former case (see Box 1). According to basic economic theory, the farmer's input decisions are governed by the law of diminishing marginal productivity according to which each additional unit of input adds an increasingly smaller amount to output and therefore to revenue. For example, the increase in output obtained by adding the eight unit of fertiliser is more than that added by the ninth unit.

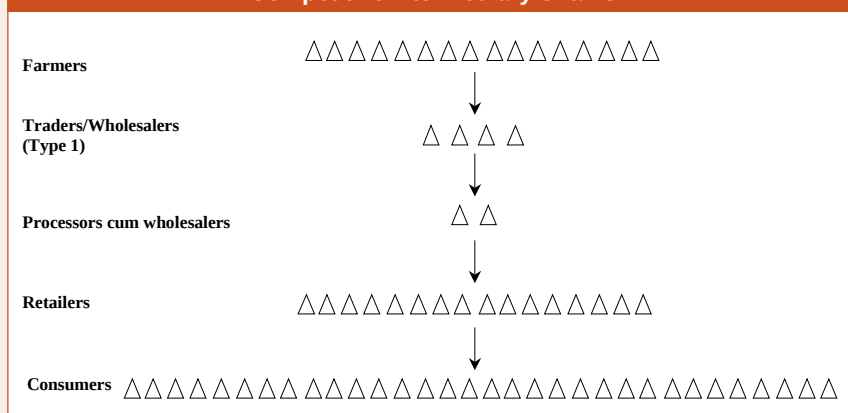
Let us assume that the price of fertiliser is Rs. 50 per kg. If the farmer cultivates land with 9 kg of fertilisers he produces 127 kg of paddy whereas if he uses 10 kg of fertilisers he produces 135 kg of paddy. At Rs.10 per kg of paddy at the farm gate, corresponding to a short chain of

competitive intermediaries, the farmer generates Rs. 80 as revenue with the 10th kg of fertiliser whereas he spends only Rs. 50 on it. As a result, it is in his interest to increase the input of fertilisers to even beyond 10 kg, the principle being that he keeps on adding fertiliser as long as the increase in revenue from each kg of fertiliser is greater than its cost.

Now consider the case where the farmer earns only a fraction of the final consumer expenditure per unit of the product because of a longer chain of less competitive intermediaries stretching from the farmer to the consumer. Thus, for the same retail price it is possible that the price of paddy at the farm gate is only Rs. 5 and the 10th unit of fertiliser now fetches a revenue of only Rs. 40, much less than the cost of Rs.50. As a result, the farmer chooses a level of fertiliser input which is much lower than 10 kg. If we compare the two cases we see that the second case leads to a much lower level of fertiliser input and therefore of total output.

Thus, we see that having a longer chain of intermediaries with lower competition at each stage is like imposing a heavier tax on the farmer, with the farmer getting a much smaller proportion of the sales revenue from each unit of output. As in many other spheres of production more of an input leads to higher output though later units of input add less to output/revenue than the earlier units.

Figure 2: Agricultural Markets Characterised by Short and Competitive Intermediary Chains



With a longer chain of intermediaries, the farmer's additional revenue from each unit of input becomes smaller. Thus, the farmer reaches the level of input where input expansion is no longer profitable very soon. He thus produces a much lower level of output than what he would have produced if the chain was much shorter and more competitive. His profit from farming is

Box 1: Investigating the Impact of Length of Intermediary Chain and Competition among Intermediaries

In this example we consider two cases – one in which the farmer is faced by long intermediary chains with little competition among intermediaries and the other in which he faces short intermediary chains with more competition among intermediaries. In the first case he faces a price of Rs. 5 per kg of paddy and in the second case a price of Rs. 10 per kg. Columns (5) and (6) present the marginal revenue accruing from each additional unit of input (see Table 1). Thus, the marginal revenue corresponding to the first unit of fertiliser is the product of the price and the difference in outputs when 1 and 0 kg of fertiliser input are used, i.e. Rs. 85 in the case of long intermediary chains and Rs.170 in the case of short intermediary chains characterised by more competition.

The farmer will go on adding units of fertiliser as long as each unit adds more to revenue than to cost i.e. the marginal profit, which equals marginal revenue less cost per unit of fertiliser, is positive. Given this criterion, the farmer employs 7 units of fertiliser under the assumption of a long non-competitive chain of intermediaries but as many as 12 units under the assumption of a short chain of intermediaries. The total profit made by the farmer from the input (computed as the sum of marginal profits accruing from first unit to seventh unit) is Rs. 140 in the first case whereas in the second case it is Rs. 780. If we assume other fixed costs to be Rs. 100 then the farmer makes a net surplus of Rs. 40 in the first case and Rs. 880 in the second case.

Table 1: Different Revenue Schedules Corresponding to the Same Output Schedule under Differing Assumptions Regarding Length of Chain of Intermediaries and Competition.

(1) Fertilizer used (kg)	(2) Paddy output (kg)	(3) =(2)*5 Revenue at Rs. 5 per kg (long intermediary chain and less competition)	(4) =(2)*10 Revenue at Rs 10 per kg (short intermediary chain and more competition)	(5) Revenue contributed by marginal kg of fertiliser in Rs. (long intermediary chain and low competition)	(6) Revenue contributed by marginal kg of fertiliser in Rs. (short intermediary chain and more competition n)	(7) Cost per kg of fertiliser (Rs)	(8) =(5)-(7) Profit contributed by marginal kg of fertiliser in Rs. (long intermediary chain and low competition)	(9) =(6)-(7) Profit contributed by marginal kg of fertiliser in Rs. (short intermediary chain and more competition)
0	20	100	200			50		
1	37	185	370	85	170	50	35	120
2	53	265	530	80	160	50	30	110
3	68	340	680	75	150	50	25	100
4	82	410	820	70	140	50	20	90
5	95	475	950	65	130	50	15	80
6	107	535	1070	60	120	50	10	70
7	118	590	1180	55	110	50	5	60
8	128	640	1280	50	100	50	0	50
9	137	685	1370	45	90	50	-5	40
10	145	725	1450	40	80	50	-10	30
11	152	760	1520	35	70	50	-15	20
12	158	790	1580	30	60	50	-20	10
13	163	815	1630	25	50	50	-25	0
14	167	885	1670	20	40	50	-30	-10

lower on two counts: a) lower level of input employed and output generated as lower revenue increments accrue to the farmer from each incremental unit of input, given that more of the sales revenue is siphoned off by intermediaries; b) lower profit generated from marginal output produced.

With profits declining due to a longer chain of less competitive intermediaries, reinvestment is lower and there is a greater possibility of low/stagnant yields. Earnings over and above subsistence are so meagre that improvements in farm land, implements and quality and quantity of variable inputs (such as fertilisers, pesticides and manure) are practically absent.

Let us consider the reasons why there is a lack of competition at the farm gate and at the other intermediary stages before the purchase by the final consumer. The large size of the market and the poor spread of transport, other infrastructure and marketing facilities ensure that

many isolated regional markets exist for farm produce. The wholesalers and processors that buy in such markets enjoy a lot of market power in these markets and are therefore able to buy farm produce at a low price. Such wholesalers/processors then converge on to the next level where the markets are again isolated because of poor infrastructure and are characterised by fewer buyers relative to sellers. This enables the buyer at each stage to earn a markup over his buying price when he himself sells the produce.

Apart from the many levels of intermediaries and the near monopsonistic/monopolistic position that each intermediary enjoys - another factor which leads to a reduction of the farmers earnings is the interlinked nature of markets. Thus, the credit market maybe linked with the market for farm produce. A farmer who is indebted to a rural wholesaler often finds himself bound to sell his produce to him at a low price. The farmer's bargaining power is also hampered by poor storage facilities.

With globalisation the problem of lower earnings over subsistence might worsen if the current situation of a long chain of intermediaries characterised by an absence of competition persists. This is not a drawback of globalisation per se. Rather globalisation brings in more international competition which any system corrupted by a lack of internal competition is hard pressed to deal with. For products with reduced import tariffs, prices in domestic wholesale markets would become closely tied to the corresponding global prices which are lower than the domestic prices under autarky (closed economy case). As prices, therefore, dip in the domestic consumer markets there will also be a downward impact on the prices that farmers obtain.

This is the case of cotton as illustrated below. It is easy to see that from 1999-00 to 2003-04 the price per quintal of cotton at the farm gate in Maharashtra in 1982 Rs. declined by Rs. 65 or 10 percent. The corresponding revenue reduction of 10 percent diminished the possibility of reinvestment by farmers.

How do we prevent the downward slump in the revenues of certain crop farmers that has accompanied globalisation? Globalisation will have some beneficial effects as the lower prices will benefit consumers including large segments of the farmer population who are net buyers of farm produce. However, farmers who are net sellers might see their incomes diminish in certain cases. This would imply lower surpluses, lower reinvestment and stagnation in yields. As other countries improve their yields, global prices in constant Rs. might fall further and lead to a tightening of the noose around the Indian farmer's neck.

We prevent this from happening by trying to dilute the market powers of buyers at the farm gate and beyond through the introduction of a measure of competition. This would imply that a large portion of the current markup of the retail price over the wholesale price could be recovered by farmers. Thus, even with a falling global price, generation of competitive forces in domestic markets for farm produce can bring about an increase in the incomes that farmers receive. Thus, it might be possible for both consumers and producers to benefit.

In the next section we look at the various developments in the Indian case which have had an effect on the state of competition in agricultural markets. In Section III we make certain policy recommendations about how to increase the level of competition in agricultural markets. The last section concludes.

2. Recent Development in the Competition Environment in Agricultural Markets

The Agricultural Produce Market Regulation Act (APMRA) has introduced regulated agricultural markets in the country. Every regulated market has a market

Table 2: Cotton Prices at the Farm Gate in Maharashtra (1999-2003)

Year	Price per quintal in Current Rs.	Price in 1982 Rs.
1999-00	1994	651.63
2000-01	1996	654.43
2001-02	1992	644.66
2002-03	1586	497.18
2003-04	1940	586.10

Source: www.indiastat.com

committee called the Agricultural Produce Market Committee where farmers, traders, commission agents, local bodies and the state government are all represented. Administrative staff, which comprise Market Secretary and auction supervisors, look after the daily operations of the market committees. Prices are fixed through an open auction in a transparent manner in front of an official of the auction committee. Charges such as the commission of the agent and labour charges for cleaning of produce are clearly defined and no new charges can be deducted from the sales proceeds from farm produce. A sub-committee exists for resolution of price disputes (Chand, 2006).

All these measures have been introduced to yield higher prices for producers. But of late there has been a fall in the proportion of produce being routed through regulated markets (Maheshwari, 1998). Moreover, infrastructure provided by these markets for perishable items like fruits and vegetables is woefully inadequate. The facility for having a common auction for all produce of the same crop coming to a market on a particular day exists more on paper than in actual practice. K. Subbarao (1989), therefore, claims that such markets are necessary but not sufficient for effective competition and for guarding the producer's interest.

The big criticism of regulated markets is that they have done nothing to diminish the long chain of intermediaries stretching from the farmer to the consumer at the retail level but have only succeeded partially in regulating the conduct of such intermediaries. The farmer still cannot come into contact with the large wholesalers from urban areas directly. By introducing requirements of licensing for traders, regulated markets have restricted entry for many traders. Such entry, if allowed, could have increased the competition for farm produce and led to farmers getting a better price.

Nevertheless, regulated markets have curbed the opportunistic behaviour of intermediaries to some extent. At the beginning of the green revolution there were only around a 1000 regulated markets in India. At present, there are more than 7000 regulated markets in the country. Each regulated market caters to an area of 459 sq km and their profusion has greatly diminished the transportation costs for farmers.

Road connectivity has also improved since independence. The length of surface roads in the country has increased from 3.38 lakh km in 1971 to 13.94 lakh km in 1997. By linking previously isolated markets and by providing farmers with access to hitherto inaccessible markets road connectivity has broadened market access for farmers. This leads to better prices for farm produce.

Next we come to storage facilities. Information about availability of warehousing facilities, which are used for storing non-perishable produce, is made available only for public sector agencies such as Food Corporation of India (FCI), Central Warehousing Corporation (CWC) and State Warehousing Corporation (SWC). A total of 57 million tonnes of warehousing capacity is available with the government. Warehouses can be used to regulate supply in markets according to demand and thereby ensure remunerative prices for the farmer.

Cold storages are used for perishable and semi-perishable commodities. The availability of cold storages also increases the bargaining power of farmers as they are not forced to sell all their produce at any low price that is offered after harvest but can wait to negotiate a better price. In the mid 1960s the storage facilities were still very meagre with only 615 units having a capacity of 6.82 lakh tons located in the country. According to recent estimates there are more than 4000 cold storage units with a capacity of 153.85 lakh tons. More than 95 percent of these are owned by the private corporate sector. The access of farmers to cheap cold storage facilities is therefore limited and they continue to look for ways to dispose of their perishable produce as quickly as possible – a state of affairs which does not lead to remunerative prices.

3. Policy Prescriptions for Stimulating Competition in Agricultural Markets

As mentioned before, efforts to get a competitive price for agricultural markets should concentrate on removing the isolation of markets for agricultural produce both in terms of geography as well as availability of information. Second, the markets that operate in between those at the farm gate and those at the retail level are characterised often by an excessive use of market power and extremely long chain of intermediaries linking the farmer to the final consumer. Therefore, a decline in the number of middle men in the chain that stretches from the farmer to the consumer is another important means of infusing competition into the system of agricultural markets.

Removing geographical isolation involves two things: (a) better connectivity in terms of the quality and density of the road and rail network which connects the villages to the towns where the wholesale market is located; and (b) better and cheaper facilities in terms of goods trains and trucks for hire which can transport the produce from the villages to markets. The railways have taken steps in this

regard by allowing people to share space in train wagons and have done away with the compulsion for each customer to book a wagon for himself. While subsidies might not be possible in this regard the provision of such facilities at cost might reduce transport costs for farmers greatly and provide farmers access to a broader market. Thus, integration of hitherto geographically isolated markets might be achieved.

In addition to the geographical isolation of markets, the informational isolation of farmers has to be alleviated. Farmers should be made aware of prices available in distant markets so that they can take advantage of price differentials between the local wholesale market and more distant whole sale markets. Information can be provided on rural radio channels on a regular basis. Such information when combined with the alleviation of geographical isolation would help to integrate hitherto isolated markets for farm produce into a large market where a common competitive price for farm produce would prevail.

It is in this regard that e-learning is very important. With e-learning and the availability of suitable online information it would be possible for farmers to know about the spot prices of farm produce not just on a day to day basis but on an hourly basis, and such knowledge can be used by the farmers to enhance the profitability of their transactions. E-learning is also very important for reduction in the number of intermediaries as it facilitates direct farming, i.e. the direct sales of farm produce to large retailers. The elimination of middle men implies that farmers receive almost the entire purchasing power of consumers with respect to food and not just a fraction of the purchasing power.

Another measure which has been advocated in this regard is contract farming where the integrator (which is often a large retailer chain) provides the farm with actual inputs or financial inputs in return for a commitment to sell produce at a designated price. Such contracts provide the farm with security of incomes. They are often dubbed “anti-competitive” but it is essential to realise that competition can be facilitated if the farmer can choose from among a number of contracts.

4. Conclusions

The low incomes enjoyed by Indian farmers are caused by the fact that their incomes do not fully reflect the purchasing power of the consumers at the retail level. Much of this purchasing power is captured through earnings by intermediaries, i.e. the wholesalers and the processors who form a long chain of transactors stretching from the farmer to the final consumer.

The geographically isolated nature of markets increases this inability to capture the entire purchasing power of the consumer. It is necessary to facilitate the full or near

full accrual of the consumer's purchasing power to the farmer as higher incomes will not only raise the living standards of the farmer but also ensure more reinvestment and thereby higher yields. With prices of many agricultural products falling in India due to globalisation, a fuller realisation of such purchasing power becomes not only a desirable but an extremely necessary phenomenon.

Geographical isolation of markets can be remedied by an improvement in the physical connectivity of markets – better roads and rail links and better freight facilities on trains and trucks, especially for small farmers. But even more important are better information flows – usage of radio networks to convey prices in distant areas to the farmers and facilitation of e-learning which can be used by the farmer to get regular updates on prices prevailing in the market. Mobile connectivity might be another step in this regard.

Reduction in the number of intermediaries existing between the farmer and the retailer can be achieved through a number of ways. One of them is “direct farming” in which the farmers themselves form a union/cooperative and deliver the farm produce directly to the wholesaler who is just next to the retailer in the value added chain or to the retailer himself (if the farmers can process the produce themselves). Then there is “contract farming” through which a farmer enters into a contract with a large integrator (such as “Reliance” or “Birlas”) which supplies seed/fertilisers to the farmer and later buys the produce from him at a designated price and time. Competition among integrators can ensure that farmers get a remunerative price.

Endnote

1 Economic Survey 2007.

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