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Some Aspects of Agricultural Marketing and Pricing Policies in India*

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Let me, at the very outset, express my deep sense of gratitude to the learned members of the Indian Society of Agricultural Economics for the honour bestowed on me by electing me to preside over its 50th Annual Conference. I am especially beholden to Professors M.L. Dantwala and V.M. Dandekar for providing me this opportunity. I have been closely associated with the affairs of the Society for the last two and a half decades in one capacity or the other. It is indeed a matter of great pleasure and privilege to address this distinguished gathering. I am conscious of my inadequacies and also of the fact that a complete and exhaustive treatment of this topic will be a strenuous exercise within the time constraint of a formal address as the present occasion requires. I have, therefore, chosen to be selective in presenting this theme.

Indian agriculture has made spectacular progress since the introduction and widespread use of new technologies such as high-yielding varieties (HYVs) of seeds, fertilisers, pesticides, etc., particularly in areas endowed with assured irrigation. Production of foodgrains increased from 72.35 million tonnes in 1965-66 to about 173 million tonnes in 1989-90. Wheat and rice are the main contributors to this increase. The production of wheat increased from 10.39 million tonnes to 49.65 million tonnes and that of rice from 30.59 million tonnes to 74.06 million tonnes over this period. The incremental foodgrain production is more concentrated in some regions than others, which has created telling challenges on the marketing system.

The elasticities of marketed surpluses with respect to production being greater than one for these crops, the increased production led to a more than proportionate increase in market arrivals. The increased surpluses and the correlated demand for non-conventional commercial inputs have put great pressure on the existing marketing system and exposed its inadequacies. Thus the country has entered a stage of development where marketing has become a serious constraint both in the sale of agricultural products and the supply of crucial inputs, thereby slowing the development process. Despite major market interventions by the government, the marketing system continues to be sub-optimal. The agricultural price policies which shape the marketing system have remained controversial. Therefore, I propose to reflect in this address on some of the broader issues of agricultural marketing, input supplies and pricing policies in India.

AGRICULTURAL MARKETING

An efficient marketing system can be an effective agent of change and an important means for raising the income levels of the farmers and satisfaction levels of the consumers. It can be harnessed to improve the quality of life of the masses. Hence, policies to increase marketing efficiency need serious consideration.

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Broadly speaking, marketing efficiency can be improved in two ways: (a) by increasing operational efficiency and (b) by increasing pricing efficiency. The former focuses on cost effectiveness, *i.e.*, reducing costs involved in the performance of different marketing functions like transportation, storage, processing, etc. The latter refers to the structural characteristics of the marketing system where the sellers are enabled to get the true value of their produce and the consumers receive true worth of their money. Generally, the two types are mutually reinforcing in the long run; one without the other is not enough.

The Central and State Governments in India have increasingly realised the critical role of marketing infrastructure in facilitating the assembling and distribution of marketed surpluses and ensuring adequate and timely supply of inputs and thus improving marketing efficiency.

The establishment of well-organised markets is the first step for providing the much needed infrastructure. There are about 22,000 primary rural periodic markets and more than 6,000 wholesale assembling markets. By the end of March 1990, 6,217 markets in the country have been brought under regulation. The average area served by a regulated market varies from state to state. It is about 75 sq. km. in the Punjab against 900 sq. km. in Rajasthan, 700 sq. km. in Madhya Pradesh, 620 sq. km. in Gujarat, 530 sq. km. in Karnataka, 480 sq. km. in Andhra Pradesh, 740 sq. km. in Uttar Pradesh and 175 sq. km. in Haryana.

The establishment of a market is meaningful only if it is sensitive to the needs of the buyers and the sellers. However, most of the regulated markets in India are devoid of basic infrastructure. Metalled roads, auction platforms, rest houses, cart parks and water facilities were provided by regulated markets in 1959-60 in India to the extent of only 37, 47, 21, 38 and 36 per cent respectively (Government of India, 1968). As a result of the measures taken by the Government of Punjab, the percentage of regulated markets having auction platforms, cattle sheds and rest houses went up from 82, 30 and 25 per cent in 1959-60 to 100, 44 and 62 per cent respectively in 1977-78. Similarly, in Andhra Pradesh, the percentage of regulated markets providing auction platforms, cattle sheds, rest houses, metalled roads, drinking water and canteen facilities went up from 46, 6, 20, 63 and 17 per cent in 1959-60 to 100, 16, 100, 84 and 84 per cent respectively in 1981-82 (Prasad, 1985). There is a need to develop and bring more markets under regulation.

According to the projections available, India will need 205 million tonnes of foodgrains by 1994-95 and 240 million tonnes by the turn of the century in addition to the requirement for edible oils, sugarcane, cotton, etc. The requirement of different agricultural inputs will also spurt accordingly. Therefore, the planning of future markets, their size, location, design, facilities, etc., needs to be taken seriously. We need to learn from our past mistakes. For example, in the Punjab, the markets which were established in the sixties and the seventies became outdated and too small to accommodate increased arrivals in the eighties. In future, the markets need to be designed with a scope for expansion so that they are functional for at least four to five decades.

A market cannot be effective unless it is connected with a network of feeder roads with its hinter-land. A well developed and efficient system of transport helps in expanding the size of the market, reduces the transit time and economises cost of transportation. Transportation is, therefore, an exceedingly important marketing function. Road, rail and air transportation are the important infrastructures which stimulate economic growth. Rural roads in particular act as catalysts in the transformation of the economy. The significance of rural roads in linking villages to the towns and cities had to increase over time as India lives in villages. Poor transport is one of the major bottlenecks in quick and cheap transport of products and inputs. Efforts have, therefore, been made to link all the villages having a

population of above 1500 and 50 per cent of the villages having a population of 1000-1500 with all-weather roads by 1990. This target has been achieved only partially as out of 5,91,677 villages, only 2,40,700 (40.7 per cent) were linked with all-weather roads by 1987-88. Thus the present situation is not satisfactory except in a few states like the Punjab, Haryana and Kerala where almost all the villages have been connected with all-weather roads. On the other extreme are the states like Orissa, Rajasthan and Madhya Pradesh where hardly 15, 21 and 23 per cent of the villages were connected by all-weather roads (Tata Services Ltd., 1990). But for this, the market remains a dead weight particularly in the eastern region of the country where the directed price signals do not reach the farmers effectively to induce production. The programme of linking all the villages with markets should be taken up on a priority basis.

The rail transport which is relatively cheaper assumed importance as bulk movement of foodgrains and other agricultural commodities has to be organised from surplus to deficit areas over long distances. Although Indian railways have made progress in route-length, modernisation of technology and traffic hauled, yet there is a shortage of wagon capacity, slow movement and high degree of congestion on trunk routes. Often, the railways have been unable to transport foodgrain stocks speedily resulting in quantitative and qualitative losses. The present system of loading produce in bags is time consuming and costly. Bulk handling needs to be introduced as it facilitates not only faster movement of the produce but is also more economical. This will, however, entail changes all along the assembly and distribution lines. Specially manufactured vans for transporting fruits, vegetables, milk and poultry products need to be introduced for carrying goods over long distances.

The pressure on transportation system during peak marketing season can be managed through adequate storage facilities at market level. Besides, agricultural commodities are perishable and seasonal in nature. But their demand is continuous throughout the year and over the years. Storage fulfils an important marketing function of regulating supply in relation to demand, stabilisation of prices and maintenance of buffer stocks. The construction of large scientific storage started in the sixties when public agencies took advantage of the huge market surpluses and entered the market in a big way for procurement of foodgrains, particularly wheat and rice. The main public agencies responsible for building storage capacity are Food Corporation of India (FCI), Central Warehousing Corporation (CWC) and State Warehousing Corporations (SWCs). Besides, some State Marketing Federations, State Civil Supplies Corporations and State Civil Supplies Departments have also built stores, though on a smaller scale.

The total storage capacity in India available with the FCI as on January 1, 1987 was 26.22 million tonnes. Out of this, 10.98 million tonnes was hired from Warehousing Corporations, State Governments and private owners (Government of India, 1990 c). Notwithstanding the expansion in storage capacity over the years, there was great strain and the capacity continued to be insufficient. So a sizeable proportion (19.67 per cent) of foodgrains stock was kept stacked under CAP (covered and plinth) and was exposed to rains, storms and bird damage. It has been estimated that out of the total storage losses, 92 per cent occurred to the stock stacked under CAP and only eight per cent in the godowns. The huge losses under CAP point to the necessity of building more scientific storage capacity.

Processing enhances the storage life of agricultural commodities and reduces their bulk for storage, adding form utility and increasing value added to the products. As the process of economic development proceeds, there is an increasing demand for processed agricultural products. There is, therefore, an urgent need to augment processing capacity for converting raw non-food agricultural products into intermediate and final products, as for example,

cotton into lint, cotton yarn or cotton cloth. Similarly, there is a scope for the establishment of more sugar factories as at present only 35 per cent of sugarcane is converted into sugar at the factory level. Further, there are huge seasonal losses in fruits and vegetables (varying from 30 to 40 per cent) which can be reduced by resorting to processing of these products to enable the producers to get better returns and to satisfy consumer demand for a variety of products. Besides the civilian market for fast food, there is a vast market for these foods for defence forces. The export market potential for flowers, processed foods and 'sunrise' products like mushroom, avocado, asparagus, cocoa, cultured prawns and cultured catfish needs to be studied and properly harnessed to add another demand dimension for farm products.

Another important adjunct of marketing process is grading. It not only facilitates transport, storage and processing but also protects the producers from exploitation and instills confidence in the consumers and ensures the quality of the products they purchase. Grading and standardisation of agricultural produce is done under the Agricultural Produce (Grading and Marketing) Act, 1937. Grading is being undertaken at the traders' and producers' levels for both internal trade and for export. But the volume of agricultural goods graded forms a very small fraction of the total volume of goods marketed. In 1987-88, the value of goods compulsorily graded for exports was Rs. 6,616 million and voluntarily graded for internal consumption was Rs. 8,831 million (Government of India, 1985). This amounts to hardly 2.78 per cent of agricultural output. The slow progress in grading at the domestic level could be ascribed to lack of adequate awareness of the advantages of grading to the producer-sellers and the consumers, besides resistance from the trade. If advantages of grading have to be reaped fully, this process needs to be introduced at all levels of marketing from the producer to the consumer. At present, there is multiplicity of grade specifications evolved by different agencies involved in the marketing of agricultural produce. It is, therefore, necessary to evolve uniform set of grades and standards which should be adopted by all the agencies in order to have common market language. Also the public agencies while procuring should carefully link prices with the quality of the produce.

Market intelligence is the *sine qua non* of an efficient marketing system. Hence efforts have been made to strengthen the agricultural marketing information. Wholesale prices of important agricultural commodities for selected markets are broadcast and telecast daily for the benefit of the farmers and the consumers. In addition, weekly market behaviour, sentiments, trends and other relevant information are also publicised through other media. However, this service is limited in coverage and needs to be made more comprehensive in its scope and its frequency needs to be increased. The prices quoted should not only be variety specific but grade specific also. Production forecasts (especially for perishable products) need to be built into the market information system.

INPUT SUPPLIES

The process of modernising agriculture primarily involves intensive use of inputs such as quality seeds, chemical fertilisers, pesticides, weedcides, irrigation, farm machinery and research and extension infrastructure. Of course, bio-techniques offer prospects for lowering production costs in agriculture by reducing requirements for some of the inputs like fertilisers, pesticides, veterinary medicines, etc., but such innovations are still in the experimental stage.

The seed is a trigger point which sets in motion the process of technological change. The returns to the non-seed part of investment depend significantly on the quality of seed used which makes it a very critical input. For increasing crop yields in any given agro-climatic

region, the need for a sound seed is well recognised. Such seed should have all the desired characteristics, namely, yield, quality of grain, resistance to pests and diseases, etc. The benefit of genetic research can reach the farmers only in the shape of improved seeds with desirable characteristics. But this is a long drawn out process. Probably less than 10 per cent of the crop area in the country is under varieties developed in the last ten years. This indicates dismally low replacement rates.

In India, there are three classes of seeds being produced - breeder, foundation and certified. The production of breeder seed for cereals, pulses and oilseeds increased from 5,270 quintals in 1980-81 to 32,000 quintals in 1988-89, the production of foundation seed increased from 2.73 lakh quintals in 1982-83 to 5.70 lakh quintals in 1988-89. The distribution of certified seeds rose from 17.17 lakh quintals in 1981-82 to 25.03 lakh quintals in 1987-88 (Government of India, 1989).

Although considerable progress has been made in seed production, yet much needs to be done to instil in Indian agriculture the impulses of self-sustained growth for meeting the growing requirements of foodgrains necessitated by increasing population. This requires a good marketing and delivery system. Production of good quality seed will be of no value if it does not reach the farmer in time. Seed marketing is a much more complicated and specialised process as compared to marketing of other inputs or commodities. Seed is a biological entity. It is produced far away from the consumption centres because such places are best suited for production from the standpoint of agro-climatic and other agronomical considerations. For example, a major portion of the hybrid seeds of maize, sorghum and bajra is produced in Andhra Pradesh and marketed all over the country. Seed produced in *rabi*-summer is supplied in the following *kharif* season. In such cases, delay of even five or six days in processing, packaging, certification and transport would mean a loss of a crop season with the loss of production and unsold seed stock. Seed marketing and delivery thus assumes immense significance in our seed strategy. Marketing of seed involves procurement of seed, distribution of seed in areas of need, sale promotion efforts and other related activities. Effective co-ordination of all these functions is, therefore, vital to achieve the objective of giving farmers good seed in time. There is also an urgent need to strengthen research on seed marketing, particularly in regard to the measures that should be taken to improve the cost effectiveness of the different agencies involved in seed marketing. In view of the low replacement rates, it would be relevant to explore the possibilities for providing greater role to the private sector particularly in the case of hybrid seeds. Its activities need to be co-ordinated with the public agencies involved in seed business.

Fertilisers have been one of the important contributing factors to the improvement of crop yields in India. With the advancement of the HYVs in the mid-sixties, the role of fertilisers has become crucial. Various studies have indicated that fertilisers contributed about 31 per cent towards rice production gains in India for the period 1965-80 (Herdt and Capule, 1983; Jara, 1985, p. 18).

The adoption of HYVs enabled India to use about 11 million tonnes of nutrients in 1989-90. The consumption of fertilisers is expected to reach about 20 million tonnes in 2000 A.D. to achieve the need based targets of agricultural production. It implies an annual increment of about 0.9 million tonnes against the past record of 0.7 million tonnes. It would be a stupendous task as the green revolution has been petering out. Besides, there is hardly any hope of lowering real price of fertilisers. Moreover, the bulk of the past growth was the outcome of diffusion of fertiliser use on irrigated land and upward movements in the rates of application due to replacement of local varieties by HYVs. So the rates of application have reached fairly high levels on irrigated lands. The future demand for fertiliser will

depend upon the spread of irrigation and the strategies to be used on unirrigated lands regarding watershed management, systems approach to farming, pricing policies, etc. The 'complementarity' between HYVs and fertilisers is clear wherever suitable varieties were available. It is not surprising that low fertility of soils is as severe a constraint as any other in promoting technological change on unirrigated land. Unless efforts are made to raise the fertility of soil on unirrigated lands through judicious use of fertilisers, the farmers would have little incentive to invest in dryland technologies irrespective of their form and content (Desai, 1986). The research efforts to stabilise returns to fertiliser in dryland agriculture need to be strengthened. As such, the availability of right type of fertilisers at reasonable prices in required quantities needs to be ensured. At present fertilisers do not reach out adequately to distant farmers. There is scope to reduce margins in the distribution of fertilisers.

Keeping in view the importance of fertilisers and their interactions with other factors of production to increase crop yields, the Government of India has been heavily subsidising investment in this crucial input. The mounting burden of subsidies is compelling the policy makers to search for means to tide over the resource crunch. Fertiliser subsidy which has risen to Rs. 3,200 crores in 1988-89 has often been considered as total surrender to the rising power of the farm lobby. However, some recent studies into the mechanics of fertiliser pricing policy have shown that the share of subsidy going to the cultivator was about 48 per cent on an average for the period 1981-82 to 1989-90 and crop-fertiliser price ratios would have been higher under free trade as compared to controlled trade. This obviously shows that the Indian cultivator has not been net subsidised on account of fertilisers despite the large quantum of budgetary or economic subsidies (Gulati, 1990). This conclusion, however, needs further scrutiny.

With technology getting diffused in agriculture, the share of cash component in total production costs is increasing. For example, it increased from 50 per cent in 1972-75 to 61 per cent in 1984-87 for wheat in the Punjab. Such trends in cost structure emphasise the need to ensure quality inputs to the farmers. Adulteration of inputs like fertilisers, pesticides, diesel, etc., has been reported. At present, the farmers do not have the facility to get the inputs tested before purchase. This calls for establishing input-testing centres at block level without legal jurisdiction.

With intensive agriculture the use of power has increased. The government promoted a policy of selective mechanisation with a view to increasing the efficiency of labour and to promote multiple cropping. The Indian tractor industry has made rapid progress with the total number of indigenously manufactured tractors increasing from the production level of 20,104 in 1970-71 to 80,004 tractors in 1986-87. The indigenous production of power tillers has increased from 1,387 thousand in 1970-71 to 3,325 thousand in 1986-87. Further, due to increasing shortage of labour during peak periods, particularly in agriculturally more developed regions of India like the Punjab, Haryana and Western Uttar Pradesh, there has been an increasing trend towards use of harvest combines. The oil crisis might slow down this process. Besides, the Central and State Governments have been imposing various types of duties and taxes on agricultural machinery. The incidence of taxes comes to about 18 per cent of the ex-factory price of tractors (Sidhu, 1986). These levies have been acting as deterrents to farm mechanisation and slowing down the process of development.

For evolution and spread of appropriate technologies, a strong base for research, education and extension has already been created by establishing 27 State Agricultural Universities (SAUs) and four deemed universities with Indian Council of Agricultural Research (ICAR) as an apex body. However, there is an urgent need to strengthen specialised research,

education and extension facilities in the area of agricultural marketing.

Formal training in agricultural marketing is being provided by Central and State Governments through Central and State Institutes and SAUs. But professional training has been hindered by several factors: the failure of many programmes to include the practical business-oriented training necessary for successful management of private or parastatal bodies, lack of teaching material specifically relevant to marketing and lack of field experience in how the marketing systems actually work. Informal training for market technicians in grading, packing, procuring and storage of agricultural produce at the middle and lower levels need to be imparted. Besides, there is need to strengthen facilities for development of private entrepreneurship in India (Sidhu and Singh, 1980).

It is evident from the foregoing that marketing technology has not kept pace with the production technology. The infrastructural and institutional support has lagged behind in the sphere of commodity marketing and input supplies. The farmers have to wait for many days before they are able to sell their produce during post-harvest period. They hardly get 40 per cent of the consumer's rupee in the case of perishables, though there is an improvement in the situation in the forties and the fifties. Similarly, to procure good quality inputs is a problem. Efforts, therefore, need to be concentrated to match production and marketing technologies.

AGRICULTURAL PRICE POLICY

Price policy is an important instrument of planning. The government can influence the allocation of resources, distribution of incomes and capital formation through price manipulation. Prices give signals to reallocate resources between sectors and even within a sector (Mellor, 1968). Within the agricultural sector, prices of individual commodities determine the relative profitability of different crops and hence shape the cropping patterns. However, the extent to which resource allocation takes place between crops depends critically on supply shifters. When yields were stagnant because of lack of technological innovations, acreage response was taken as a proxy for supply response. However, the elasticity of output with respect to price is the sum of the elasticity of acreage and elasticity of yield, assuming interaction to be zero. Some recent studies on supply response to prices indicate that this response has been increasing with the adoption of technological changes. Compared with the acreage elasticity of 0.08 for wheat during 1919-45, there was a marked increase in the acreage elasticity during the 1957-70 period (0.28), the elasticity of production being 0.82 (Krishna and Raychaudhuri, 1980). All these elasticities were statistically significant. More recent studies of supply response for wheat in the Punjab (India) for the period 1952-53 to 1979-80 have also reported that although the elasticity of area with respect to price declined from 0.03 to 0.02, the elasticities of yield and production increased from 0.05 and 0.08 during the pre-green revolution period to 0.50 and 0.52 during the post-green revolution period (Ranade, Jha and Delgado, 1988). For still more recent data (1981-84) for the Punjab State, the output elasticities for wheat and paddy with respect to price were estimated to be 0.69 and 0.56 respectively (Sidhu and Kaul, 1990). These results indicated that production elasticity with respect to price increased in the wake of the technological breakthrough mainly due to increase in the yield elasticity.

In view of the responsiveness of supply to changes in prices *inter alia* other factors, the Government of India is intervening in food market with the twin objectives of attaining self-sufficiency in foodgrains through better prices to farmers and also ensuring consumer protection.

Since the mid-sixties, the Government has been announcing minimum support and

procurement prices for important agricultural commodities on the recommendations of the Commission for Agricultural Costs and Prices (CACP). The Commission has been guided by two main considerations in determining support prices - the cost of production and some principle of parity. Broadly speaking, in the fifties, the purchase price of wheat did not cover the full cost of production (cost C). This situation was reversed in the mid-sixties when the procurement price has been well above the cost of production.

For rice, by contrast, the purchase price was below the cost of production in West Bengal and in all the southern states but it covered the cost of production in the northern states until the early seventies (Krishna and Raychaudhuri, 1980). Since the mid-seventies, however, purchase prices fixed for paddy have, in general, been close to or higher than the weighted average cost of production. An important issue that emerges in adopting cost of production criterion is the wide variation in cost of production per quintal of these crops within different regions and even within different sub-regions of the states. The cost differences between technologically advanced states and less developed states are especially striking. Some economists have, therefore, argued for regional differentiation in prices (Rath, 1985). This, however, is not justifiable on the ground that the principle of comparative advantage conduces to specialisation and efficiency in production.

It may be of interest to mention here that even in the State of Punjab which is the seat of green revolution and has some comparative advantage over other states, the real margins in production have been shrinking for wheat despite the declining trends in real cost of production per unit of output. The cost of production in real terms for wheat decreased steadily at an average annual rate of 2.9 per cent (Tables I and II, Figures 1 and 2 and Appendix A). Although some scholars have questioned whether the cost of wheat production has indeed declined (Kahlon, 1984), more recent data suggest that the decline observed here is consistent with observations for wheat in other states of India but not generally for other crops (Mruthyunjaya and Kumar, 1989). Nonetheless, a declining real cost of production of 2.9 per cent against a decrease in real wheat prices of 3.6 per cent annually, implies some squeezing of the profit margin to farmers. Hence, the real margin per quintal of wheat produced at 1987 prices has fallen from Rs. 60/q in 1972-75 to only Rs. 22/q in 1984-87. Despite a significant increase in yield (2.32 per cent per annum), the real margin/ha has also fallen by more than half over this period. Likewise, the percentage margin of the sales price of wheat over the production cost has fallen from 28 per cent to 15 per cent over this period (Sidhu and Byerlee, 1990). This is true not only for wheat but for the entire mix of crops (Grewal *et al.*, 1990).

TABLE I. COSTS AND RETURNS IN WHEAT CULTIVATION IN THE PUNJAB

Costs/returns	Period				
	1968-71 (2)	1972-75 (3)	1976-79 (4)	1980-83 (5)	1984-87 (6)
1. Gross income (Rs./ha)	2,073	2,586	2,955	4,107	5,859
2. Total cost (Rs./ha)	1,518	2,034	2,672	3,696	5,055
3. Profit margin (Rs./ha)	555	552	283	511	834
4. Per cent profit margin	38	28	10	15	15
5. Cost/ql. (Rs./q)	60	72	103	118	138
6. Procurement price (Rs./q)	76	94	113	135	159
7. Profit margin (Rs./q)	16	22	10	17	21
8. Real margin/q (Rs./q) ^b	61	60	21	24	22
9. Real margin/ha (Rs./q) ^c	1,724	1,522	509	714	739

Source: (1) a. Sidhu (1979). (2) Sidhu and Byerlee (1990).

b. Per cent profit margin over cost. c. Constant 1987 rupees.

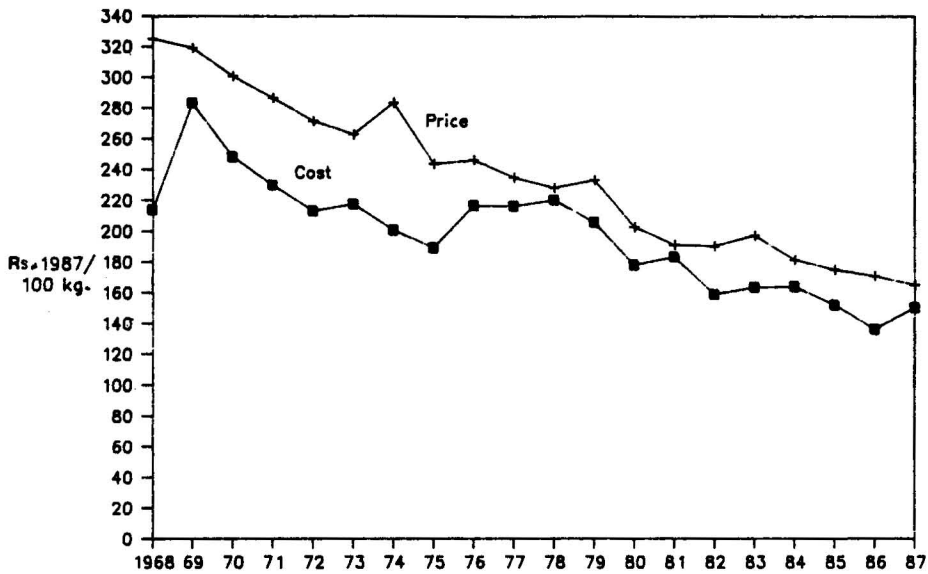


Figure 1-Procurement price and cost of production for wheat production in the Punjab, India.

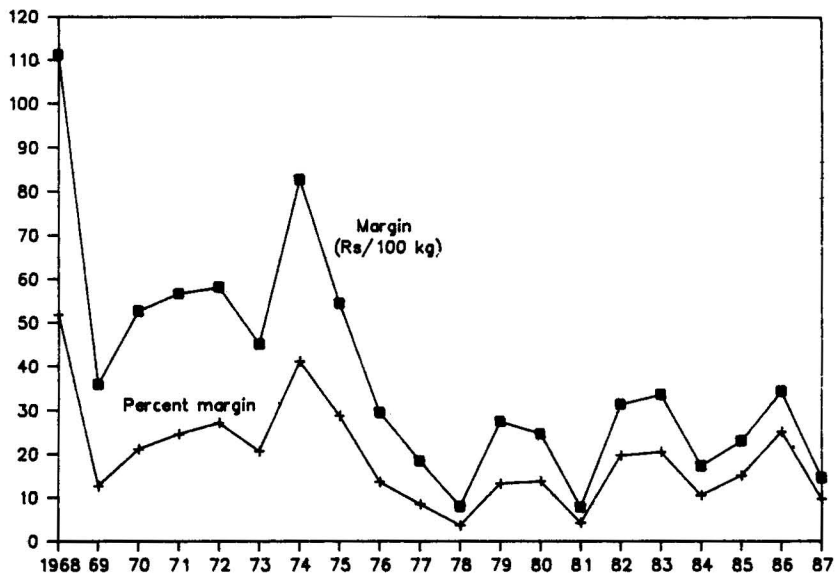


Figure 2-Real price margin (Rs./100 kg) and percent margin over costs in wheat production, Punjab, India.

These changes are consistent with the hypothesis that farmers initially gained much of the benefits of using the new wheat technology, specially over the earlier phase of the green revolution. The rate of return to fixed capital investment was above 40 per cent during the early seventies and declined to less than 7 per cent by 1986-87 (Kahlon and Singh, 1990). Since 1975 government policy appears to have favoured consumers, with procurement price being set to exploit the downward trend in production costs brought about by technical change.

TABLE II. TRENDS IN PROCUREMENT PRICE, COST OF PRODUCTION AND MARGINS IN WHEAT PRODUCTION IN PUNJAB, 1972-87

Trend in real price/cost (1)	Per cent/year (2)	Coefficient of variation# (3)
Total cost/quintal	-2.93***	7
Procurement price	-3.58***	5
Profit margin/quintal	-6.64**	55
Profit margin/ha	-4.32	43
Percentage margin	-3.72	56

Source: Sidhu and Byerlee (1990).

Note:- **, *** denote significance at the 5 per cent and 1 per cent level respectively. # The CVs here are calculated around the linear time trend.

Another observation from the data is that although procurement prices have been quite stable with coefficient of variation (CV) around trend of 5 per cent and average yields have also shown low variability (CV=9.0 per cent), the returns to wheat production have shown a high variability of 55 per cent around trend (Table II). Much of this variability occurred during the early seventies when fertiliser, fuel and grain prices were particularly volatile. Since 1976 the CV of net returns in wheat production has still averaged as high as 44 per cent. Hence, stabilisation of producer prices does not appear to have been very effective in reducing variability in farmers' income (Sidhu and Byerlee, 1990). The high variability in returns from production of wheat which is one of the most stable crops under assured irrigation is a sharp pointer to the high risk to which the farmers are exposed in farming profession in general.

Another controversial issue relates to the assertion that change in barter terms of trade must form the basis for fixation of administered prices for foodgrains. So whether or not the terms of trade moved in favour of the agricultural sector has been much debated in India (Dar, 1969; Thamarajakshi, 1969; Mitra, 1977; Sidhu and Singh, 1979; Kahlon and Tyagi, 1983). Recent evidence indicates that the terms of trade have generally been moving against agriculture over the period 1970-71 to 1988-89 (Government of India, 1990 *b*; see Table III). Recently, the Expert Committee for Review of Methodology of Cost of Production of Crops has made two important suggestions: Firstly, that the family labour should be evaluated on the basis of actual wages paid to casual labour and secondly, that cost of management should also be included as part of cost of production. Although the first recommendation is quite rational and acceptable, the second recommendation has caused ripples and it has been argued that the farmer reaps profits/losses for his entrepreneurial activity. It is feared that inclusion of management cost in determination of administered level of prices could result in inflation. However, in view of the dwindling profitability and high risk in agriculture, this argument does not seem to hold good. The increase in procurement price on account of the above will lead to increased production which will have sobering effect on the market and help in food security.

TABLE III. INDICES OF PRICES RECEIVED AND PRICES PAID BY FARMERS AND TERMS OF TRADE IN INDIA, 1970-71 TO 1988-89
(Triennium ending 1971-72 = 100)

Year	Commodities sold for			Prices paid for commodities purchased for				
	final consumption (2)	Intermediate consumption (3)	All consumption (4)	Final consumption (5)	Intermediate consumption (6)	Capital formation (7)	All uses (8)	Terms of trade (9)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1970-71	98.8	102.9	100.5	100.6	100.3	100.2	100.5	100.0
1971-72	102.7	102.1	102.5	105.7	101.6	107.8	105.1	97.5
1972-73	115.3	119.2	116.9	113.2	109.6	117.2	112.9	103.6
1973-74	145.0	144.9	145.0	133.6	126.3	134.3	132.3	109.6
1974-75	178.0	150.2	166.8	162.3	188.1	159.5	166.9	100.0
1975-76	153.4	126.2	142.4	159.4	193.1	188.9	168.3	84.6
1976-77	151.8	164.7	157.0	166.0	191.5	194.3	173.2	90.6
1977-78	163.9	166.1	164.8	177.3	193.6	191.6	181.6	90.7
1978-79	157.2	157.0	157.1	180.7	185.1	207.8	183.9	85.4
1979-80	179.0	194.9	185.4	209.5	191.0	246.2	209.3	88.6
1980-81	202.2	230.6	213.6	233.3	255.0	317.9	244.8	87.3
1981-82	216.6	235.4	224.2	249.1	296.4	392.5	270.5	82.9
1982-83	230.8	246.7	237.2	254.5	308.2	429.1	279.9	84.7
1983-84	253.0	273.2	262.1	278.4	325.6	454.2	302.6	86.3
1984-85	265.3	293.9	276.8	298.1	328.8	503.2	321.8	86.0
1985-86	282.4	271.5	278.0	313.2	343.3	524.5	337.4	82.4
1986-87	311.0	327.9	317.8	337.3	368.6	542.5	361.2	88.0
1987-88	329.7	380.7	350.3	382.7	387.5	574.7	400.5	87.5
1988-89	371.1	367.7	369.7	402.5	390.5	652.7	422.2	87.6

Source: Government of India, (1990 b).

Note: The figures for 1988-89 are provisional.

Besides, what is more important for purposes of national policy is not whether terms of trade improved or deteriorated but the impact of the movement of terms of trade on aggregate farm output and on inter-farm and inter-regional equality. It is being argued that given the significant concentration of marketed surpluses in a few states and among large holdings within a state, high support prices will probably result in a perverse income transfer from the relatively poorer regions and sub-marginal farmers to larger farmers and better endowed regions (Janvry and Subbarao, 1984). At the same time, keeping agricultural prices low relative to non-agricultural prices can create a widening gap in rural-urban income distribution. The poorer sections in the rural area suffered most when rural income stagnated. The decline in rural wages might stimulate migration to urban areas putting pressure on urban utilities and causing urban slums to develop. A sharp increase, on the other hand, might cause serious erosion in the real income and food consumption of the poor as the marginal propensity to consume food was high among the poor. Thus one could advocate for the expansion of irrigation facilities and cost effective technology which improves productivity in preference to price support measures.

Further, the relative merits of input price stabilisation and output price support have attracted attention in the recent past (Barker and Hayami, 1976; Ahmed, 1978, 1979; Sidhu and Sidhu, 1985). These studies establish the superiority of input subsidies particularly in irrigation and fertilisation as the best means to achieve necessary goals.

The main thrust of India's agricultural price policy is to stimulate growth through ensuring remunerative prices to the farmers and at the same time protecting consumers' interest. Even small farmers could be benefited because of assured market during glut season. They have no holding power like big farmers. The poor consumers are benefited through low issue prices. The public distribution system has helped in reducing the difference in the

per capita availability of foodgrains in different states. The achievement of these objectives will depend upon the efficiency of the market operations.

Food management has, therefore, been transformed from the earlier emergency supply orientation to regular supply management for meeting the requirement of the poor and low income population as part of the overall development efforts. Public distribution has grown from about 9 to 13 million tonnes at the end of the sixties to 13 to 15 million tonnes towards the late eighties. Similarly, procurement of foodgrains has risen from 4 to 6 million tonnes in the sixties to 15 to 20 million tonnes towards the late eighties (Government of India, 1990a).

For this purpose, the Central and State Governments have established parastatal and co-operative agencies to handle the marketing of agricultural products and inputs. Amongst the public enterprises are the Food Corporation of India, State Marketing and Co-operative Supplies Federations, State Departments of Food and Civil Supplies and State Food and Civil Supplies Corporations. The FCI is the main agency involved in procurement. The main function of the FCI is to purchase, store, move and distribute foodgrains and other foodstuffs on behalf of the Central Government. It is also engaged in processing of foodstuffs, and handling and distribution of fertilisers.

The performance of public agencies has not been quite satisfactory. The consumer subsidy which represents the deficit incurred by the FCI in issuing foodgrains at prices lower than their economic cost together with carrying charges on buffer stocks amounted to Rs. 1,924 crores in 1987-88. The public sector organisations have top heavy administration and low operational efficiency (Johl, 1989). The economic cost of wheat handled by the FCI was 22 per cent higher than the procurement price in the early seventies. This cost increased to 30 per cent by 1977-78 and further escalated to 54 per cent by 1985-86. In the case of rice also, the difference between the economic cost and the procurement price has been continuously on the increase. Although some portion of this increase may be due to the rise in the obligatory charges, yet the fact remains that at the current economic cost of procuring and distributing foodgrains, government's involvement in marketing can be sustained only through high subsidies (Tyagi, 1990). However, the FCI has been successful in stabilising the prices by curbing the speculative activities of the private trade, besides operating the public distribution system. The high cost of system inefficiency needs to be drastically cut down through better management, evaluation and monitoring of various activities of public agencies. Also formulation of policies which give greater scope for privatisation of some marketing functions in foodgrain trade can help in making the system work better (Cumings, Jr., 1967).

AN OVERVIEW

A lot has been done by the government in regard to development of marketing infrastructure in the form of regulated markets/procurement centres, grading and standardisation, storage and processing facilities to cope with the requirements to handle rapidly growing marketed surpluses and rising demand for modern farm inputs. However, much more needs to be done to meet the emerging requirements. Market intelligence services need to be streamlined. Research and development programmes need to be focused to find solution to various problems involved in agricultural marketing and input supplies.

Agricultural prices particularly food prices have far reaching implications for the entire economy. Therefore, special emphasis should be placed on formulating agricultural output and input pricing policies which can best sub-serve the different goals particularly that of

growth with equity and stability (Dantwala, 1990). This calls for a two-pronged pricing strategy. One, an integrated pricing system needs to be evolved for promoting appropriate crop-mix. And, two, not to over-emphasise on price incentives to the neglect of input subsidisation which is disinflationary and relatively economical and equitable. Further, the subsidies as these appear to be at present, need to be grilled through economic analysis to get to the case whether the farmers are really net subsidised for some inputs. Careful analysis of growth and equity impacts of price policies should be conducted before making any serious reform. Non-price factors like technology, institutions and infrastructure can often resolve the conflicts between growth and equity involved in a positive price policy. As such, balancing among price and non-price factors in the formulation of agricultural price policies is a key task.

Further, there is an imperative need to reorient the role of parastatals which are running at huge losses resulting in the mounting burden of subsidies. There should be an integrated approach to the provision of support services in agricultural marketing. These services are performed by different agencies without proper co-ordination. The role of the private trade in the marketing process needs to be understood and attention should be paid to development of private entrepreneurship.

APPENDIX A

COST OF PRODUCTION, PROCUREMENT PRICE AND PROFIT MARGIN FOR WHEAT
IN THE PUNJAB, 1967-87

Year	Total cost (Rs./100 kg)	Procurement price (Rs./100 kg)	Profit margin (Rs./100 kg)	Per cent margin	Real cost ^a (Rs./100 kg)	Real margin (Rs./100 kg)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1967-68	50.0	76	26.0	51.9	214.1	111.2
1968-69	67.5	76	8.5	12.7	283.3	35.9
1969-70	62.7	76	13.3	21.2	248.2	52.7
1970-71	61.0	76	15.0	24.7	229.9	56.7
1971-72	59.7	76	16.3	27.3	213.2	58.2
1972-73	67.1	81	13.9	20.7	217.8	45.1
1973-74	74.3	105	30.7	41.2	200.7	82.8
1974-75	87.8	113	25.2	28.8	189.2	54.4
1975-76	99.5	113	13.5	13.6	216.8	29.5
1976-77	101.4	110	8.6	8.5	216.5	18.4
1977-78	108.6	113	3.9	3.6	220.4	8.0
1978-79	101.5	115	13.5	13.4	205.9	27.5
1979-80	102.8	117	14.2	13.9	178.1	24.7
1980-81	124.7	130	5.3	4.3	183.5	7.8
1981-82	118.5	142	23.5	19.8	158.9	31.5
1982-83	125.2	151	25.8	20.6	163.5	33.7
1983-84	137.5	152	14.5	10.6	164.1	17.3
1984-85	136.3	157	20.7	15.2	151.9	23.0
1985-86	129.3	162	32.7	25.3	136.3	34.5
1986-87	150.4	165	14.6	9.7	150.4	14.6

Source: Sidhu and Byerlee (1990).

a. Deflated by wholesale price index to 1987 rupees.

REFERENCES

- Ahmed, R. (1978). "Price Support versus Fertiliser Subsidy in Increasing Rice Production in Bangladesh", *The Bangladesh Development Studies*, Vol. 6, No. 2, June.
- Ahmed, R. (1979). Foodgrain Supply, Distribution, and Consumption Policies within a Dual Pricing Mechanism: A Case Study of Bangladesh, Research Report 8, International Food Policy Research Institute, Washington, D.C., U.S.A.

- Ahmed, R. and John W. Mellor (1988). "Agricultural Price Policy-The Context and Approach", in John W. Mellor and Raisuddin Ahmed (Eds.) (1988). *Agricultural Price Policy for Developing Countries*, Oxford University Press, New Delhi.
- Asian Productivity Organisation (1989). *Marketing Farm Products in Asia and the Pacific*, Tokyo, Japan.
- Asian Productivity Organisation (1990). *Agricultural Output and Input Pricing*, Tokyo, Japan.
- Barker, R. and Hayami, Yujiro (1976). "Price Support versus Input Subsidy for Food Self-Sufficiency in Developing Countries", *American Journal of Agricultural Economics*, Vol. 58, No. 4, Part I, November.
- Cummings, Jr., R.W. (1967). *Pricing Efficiency in Indian Wheat Market*, Impex India, New Delhi.
- Dantwala, M. L. (1990). "Agricultural Prices under Political Pressure", *Economic and Political Weekly*, Vol. 25, No. 38, September 22.
- Dar, Ashok (1969). "Domestic Terms of Trade and Economic Development in India", *Cornell International Agricultural Development Bulletin*, No. 12, Ithaca, New York.
- Desai, Gunvant (1986). "Fertiliser Use in India: The Next Stage in Policy", *Indian Journal of Agricultural Economics*, Vol. 41, No. 3, Conference Number, Part, I, July-September.
- Government of India (1968). *Working of Regulated Markets in India - Regulated Markets*, Vol. II, Directorate of Marketing and Inspection, Ministry of Agriculture and Rural Development, Nagpur.
- Government of India (1976). *Report of the National Commission on Agriculture 1976*, Part XII - Supporting Services and Incentives, Ministry of Agriculture and Irrigation, New Delhi.
- Government of India (1985). *Activities of Directorate of Marketing and Inspection*, Directorate of Marketing and Inspection, Ministry of Agriculture and Rural Development, Faridabad.
- Government of India (1989). *Report of Expert Group on Seed*, Department of Agriculture and Co-operation, Ministry of Agriculture and Co-operation, New Delhi.
- Government of India (1990 a). *Economic Survey, 1989-90*, Ministry of Finance, New Delhi.
- Government of India (1990 b). *Final Report of Expert Committee for Review of Methodology of Cost of Production of Crops*, Department of Agriculture and Co-operation, Ministry of Agriculture, New Delhi, July.
- Government of India (1990 c). *Bulletin on Food Statistics, 1987-89*, Directorate of Economics and Statistics, Department of Agriculture and Co-operation, Ministry of Agriculture, New Delhi.
- Grewal, S.S.; D.S. Sidhu and M.S. Sidhu (1990). *A Study on Farm Incomes in Punjab*, Department of Economics and Sociology, Punjab Agricultural University, Ludhiana.
- Gulati, Ashok (1990). "Fertiliser Subsidy: Is the Cultivator Net Subsidised?", *Indian Journal of Agricultural Economics*, Vol. 45, No. 1, January-March.
- Herdt, R.W. and C. Capule (1983). *Adoption, Spread and Impact of Modern Varieties in Asia*, International Rice Research Institute, Manila.
- Janvry, Alain de and K. Subbarao (1984). "Agricultural Price Policy and Income Distribution in India", *Economic and Political Weekly*, Vol. 19, Nos. 51 and 52, December 22-29.
- Jara, Maricar B. (1985). "Experts Allay Fears on Harmful Effects of Hiked Fertiliser Use", *Agricultural Information Bulletin*, Vol. 7, No. 4, December.
- Johl, S.S. (1989). "Handling of Foodgrains in India", in *Proceedings of the National Symposium on Handling, Marketing, Transportation and Storage of Foodgrains in India*, Punjab Agricultural University, Ludhiana.
- Kahlon, A.S. (1984). *Modernisation of Punjab Agriculture*, Allied Publishers Pvt. Ltd., New Delhi.
- Kahlon, A.S. and Karam Singh (1990). "Rising Costs: Consequences for Indian Farmers", *The Economic Times*, October 31.
- Kahlon, A.S. and D.S. Tyagi (1983). *Agricultural Price Policy in India*, Allied Publishers Pvt. Ltd., New Delhi.
- Krishna, Raj and G.S. Raychaudhuri (1980). *Some Aspects of Wheat and Rice Price Policy in India*, World Bank Staff Working Paper 381, The World Bank, Washington, D.C.
- Mellor, J.W. (1968). "The Functions of Agricultural Prices in Economic Development", *Indian Journal of Agricultural Economics*, Vol. 23, No. 1, January-March.
- Mitra, Ashok (1977). *Terms of Trade and Class Relations: An Essay in Political Economy*, Franc Cass, London.
- Mruthyunjaya and P. Kumar (1989). "Crop Economics and Cropping Pattern Changes", *Economic and Political Weekly*, Vol. 24, Nos. 51 and 52, December 23-30.
- Prasad, S.A. (1985). *Agricultural Markets in India*, Mittal Publications, New Delhi.
- Ranade, C.G.; Dayanatha Jha and Christopher L. Delgado (1988). "Technological Change, Production Costs, and Supply Response", in John W. Mellor and R. Ahmed (Eds.) (1988). *Agricultural Price Policy for Developing Countries*, Oxford University Press, New Delhi.
- Rath, Nilakantha (1985). "Prices, Costs and Terms of Trade of Indian Agriculture", Presidential Address delivered at the 45th Annual Conference of Indian Society of Agricultural Economics, *Indian Journal of Agricultural Economics*, Vol. 40, No. 4, October-December.
- Sidhu, D.S. (1979). *Price Policy for Wheat in India*, S. Chand & Co. Ltd., New Delhi.
- Sidhu, D.S. (1986). "Policies Pertaining to Agricultural Marketing and Input Supply", *Indian Journal of Agricultural Economics*, Vol. 41, No. 3, July-September.

- Sidhu, D.S. (1989 a). Policies on Promoting Agricultural Marketing Facilities for Small Farmers in Asia and the Pacific, Association of Food Marketing Agencies in Asia and the Pacific, FAO, Regional Office for Asia and the Pacific, Bangkok, Thailand.
- Sidhu, D.S. (1989 b). Three Decades of Agricultural Marketing Development in India, Food and Agriculture Organization of the United Nations, Regional Office for Asia and the Pacific, Bangkok, Thailand.
- Sidhu, D.S. and Derek Byerlee (1990). Technical Change in Wheat Production in the Post-Green Revolution Period, Economics Program Working Paper, Centro Internacional de Mejoramiento de Maiz y Trigo (CIMMYT), Mexico.
- Sidhu, D.S. and J.L. Kaul (1990). Methodology for Simultaneous Determination of Factor and Product Prices of Punjab Crops, Department of Economics and Sociology, Punjab Agricultural University, Ludhiana.
- Sidhu, D.S. and A.J. Singh (1979). "Domestic Terms of Trade and Economic Development", *Indian Journal of Agricultural Economics*, Vol. 34, No. 4, October-December.
- Sidhu, D.S. and A.J. Singh (1980). Agricultural Marketing Training in India, Punjab Agricultural University, Ludhiana.
- Sidhu, J.S. and D.S. Sidhu (1985). "Price Support versus Fertiliser Subsidy: An Evaluation", *Economic and Political Weekly*, Vol. 20, No. 13, March 30.
- Tata Services Limited (1990). Statistical Outline of India 1989-90, Department of Economics and Statistics, Bombay.
- Thamarajakshi, R. (1969). "Inter-sectoral Terms of Trade and Marketed Surplus of Agricultural Produce, 1951-52 to 1965-66", *Economic and Political Weekly*, Vol. 4, No. 26, June 28.
- Tyagi, D.S. (1990). *Managing India's Food Economy*, Sage Publications, New Delhi.