PAKISTAN: AN ANALYSIS OF AGRICULTURAL PRICING POLICY

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CPD Discussion Paper No. 1983-3
March 1983

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PAKISTAN

AN ANALYSIS OF AGRICULTURAL PRICING POLICY

INTRODUCTION

The Government of Pakistan guarantees support prices for each of the four major crops -- wheat, rice, cotton and sugarcane. In 1981/82, these crops accounted for 58% of value added in agriculture and 17% of GDP. Since these crops comprise a significant component of GDP, it is important to evaluate the manner in which the support prices are decided and to examine the workings of the markets for these crops. Several relevant questions immediately come to mind. How are the price levels set and how have they changed over time? How do domestic price levels compare to international prices? Can the pricing mechanism be improved so that it results in a net welfare gain? If so, who would gain and who would lose from the alternate pricing policy? By how much? What is the marketing structure for these crops? Could an alternate market structure improve net welfare? The purpose of this study is to examine the structure and workings of the markets for each of the four major crops with a view towards suggesting changes in market structure and/or in government pricing policy that would result in increased welfare. Where possible, an attempt will be made to measure changes in the welfare of consumers, producers and the Government, arising from these alternate policies.

Among the crops purchased by the Government at fixed prices, wheat and sugar are sold at a subsidy at controlled prices via a rationshop scheme which will be described later. In addition, there is a parallel open market for both crops. Rice and cotton are also domestically consumed in the open

This paper was prepared at the request of the Pakistan Division and is based on the findings of a mission that visited Pakistan in September, 1982. The author would like to thank the numerous people in Pakistan who provided important information on agricultural markets in Pakistan. He is also grateful to colleagues at the World Bank for helpful comments on an earlier draft and to Janet Entwistle for competent research assistance.
market and are major exports. Only the Government is allowed to import or export any of these commodities. In the past, domestic prices have generally been kept at well below international prices and so have served as an implicit tax. There is virtually no direct taxation in agriculture. On the other hand, the Government has subsidized fertilizer, water, plant protection and wheat seed. The biggest input subsidies are in fertilizer and water and have been allocated 5.1% and 2.3% of the FY83 development expenditure budget. At the recommendation of the World Bank and the IMF, the Government is now attempting to reduce these subsidies. They are committed to eliminating the fertilizer subsidy by FY85 and to recovering all operating and maintenance costs on water by the late 1980s or early 1990s. Substantial progress has been made towards this end.

The price paid to the farmer by the government, the "procurement price," is based on the farmer's input costs — the idea being to assure a fair and equal return to the farmer for each major crop. In 1981, with the assistance of the World Bank, the Government set up an institution called the Agricultural Prices Commission (APC), which is responsible for advising the Government on setting prices for agricultural inputs and outputs. This advisory body is under the Ministry of Food and Agriculture and its recommendations have to be approved by the Cabinet. The APC is meant to provide a firmer analytical underpinning for pricing decisions based on an analysis of their effects on farm incomes and productivity, consumer prices and Pakistan's competitiveness in world markets. It is expected that the APC will live up to its goals and will not solely rely on the cost-based approach in deciding output prices.

In recommending prices for the FY83 crops, the APC requested provincial governments to give estimates on the costs of production of each
crop. The provincial government estimates are based on discussions with prominent farmers since there have been no extensive farm surveys conducted by the provinces since 1980. The cost figures purport to refer to the projected costs of production of an "average leading farmer." In the case of rice and cotton, the two major exports, the advice of the chairmen of the two marketing boards, the Rice Export Corporation of Pakistan (RECP) and the Cotton Export Corporation (CEC) was also sought. Simultaneously, the APC also conducted its own analysis of the increase in the costs of production based on changes in input prices. No farm survey was conducted for this purpose by the APC last year, but one such survey is underway in FY83. The approach used for last year's recommendation was an incremental one. The percentage increase in input prices over last year was estimated using provincial data, and the percentage increase in output prices was decided accordingly. The final recommendations of the APC were made after a series of lengthy discussions with officials from the provincial governments, the Ministry of Food and Agriculture, and several special interest groups. The problem with this cost based approach is that it is difficult to estimate costs accurately — farmers will have different costs depending on the soil type, road network, water-availability, etc. In addition the cost based approach reduces the incentives for farmers to reduce costs, innovate and increase productivity through better management.

In its first year of operation, the APC emphasized the cost-based pricing approach with international comparisons playing a smaller role. However, it is expected that future recommendations will more explicitly consider comparative advantage issues as well as attempt to measure the impact of price changes on incomes of farmers, consumers and producers. Note that any government system of support prices will have "cost-plus" as an important
element. To discard it completely in favor of international comparative advantage principles would be politically unacceptable. The APC is also logically the institution which could follow-up on the suggestions made in this paper. None of the recommendations of this study are entirely novel in that the Government has considered them previously. In particular, the APC has suggested some of these changes. However, this study may be useful in explicitly laying out the issues involved in the making of the policy changes and in measuring the gains from carrying them out.

MARTKET STRUCTURES AND PRICING POLICIES:
DESCRIPTION, ANALYSIS AND POLICY RECOMMENDATIONS

This section discusses in some detail the structure and workings of markets for each of the major crops in Pakistan. While Government involvement in marketing and storage has increased considerably over the decade, over one half of the marketable surplus is still purchased from the farmer by middlemen in the private sector. The system of distribution from the farmer to the final consumer is complex and involves several types of middlemen as well as the Government. Since there are different processes and institutions involved in the marketing of the major crops, it is best to describe each separately. After describing the structure and workings of the market for a crop, the pricing policies for the crop are described. Based on an analysis of the market structure, pricing policies and the government's objective, suggestions for improving the market structure or pricing policy are put forward. Before moving to issues that are specific to each crop, it is useful to address some aspects of pricing policy that apply to more than one crop.

Under assumptions of no uncertainty, no externalities or other market distortions, economic efficiency dictates that the domestic consumer
and producer price be equal to the international price, adjusted for transportation and handling costs. This is because the country has the option of exporting or importing the good. If, for example, it costs the country more to produce the good domestically than to import it, it makes sense to import it assuming, of course, that all costs are valued correctly. Similarly if the exporter is making large profits per unit of the export good, it makes sense to raise the domestic price of the good to induce greater production, assuming that the country’s export of the good is not large enough to affect world prices. Before applying the result, care must be taken to ensure that there are no distortions in the economy that may change the result. For instance, does the exchange rate used correctly reflect the true opportunity cost of foreign exchange? If, for example, there are input subsidies so that the domestic price underestimates the opportunity cost of producing the good, the correct domestic price to set will be less than the international equivalent price. Since Pakistan’s current exchange rate adequately reflects the opportunity cost of foreign exchange and since input subsidies are being removed, this criteria suggests setting domestic prices at international levels adjusted for transportation and handling.

Using adjusted international prices to determine domestic prices implies that domestic prices fluctuate with international prices. However, there are some arguments that suggest that there are some efficiency gains to be had from price stabilization. There are basically two such arguments. The first shows that under certain fairly restrictive assumptions on the shape of demand and supply curves, the net welfare gains to consumers and producers are lower for two different prices in two periods than a price that is midway
between the two prices for both periods. 1/ The second argument recognizes that while farmers are risk averse and there is uncertainty regarding future prices, there are no futures markets which allow the farmer or middleman to insure against uncertainty. Thus the price stabilization mechanism is a second-best argument which allows the farmer to insure against risk in the absence of futures markets. Studies by Newbery and Stiglitz 2/ have shown that the gains from such stabilization schemes are typically small as compared to the costs and that there are often alternate ways to achieve stabilization objectives. On the other hand, the Government of Pakistan has been firmly committed to a price setting policy for major crops and it is politically infeasible that they will move away from such a system in the next few years. Therefore, rather than conduct the difficult exercise of attempting to measure the gains and losses from moving away from price stabilization, it was thought more useful to consider how best to set price policies, given that the Government has decided to do so. Thus all price policies considered here will imply some form of Government set price -- the level and how it should change over time will be the major considerations.

Price fluctuations to the farmer can be minimized by completely fixing the real producer price. This is indeed the principle upon which the Government of Pakistan bases its support price. However, except by coincidence, this policy would not reflect the comparative advantage principle outlined earlier. The gain from price stabilization depends on the degree of unforeseeable international price fluctuation of the commodity whose price is being stabilized, the degree of risk averseness of the farmer, and the cost of


2/ Ibid.
switching from one crop to another. Producers and consumers gain more from price stabilization when the international price variation is large than when the price variation is small.

Gains can be realized by following comparative advantage principles and also by following complete price stabilization policies. At the one extreme, a country could set prices based on the expected international price next year. At the other extreme a country could permanently fix the real price of the commodity. The optimal policy must lie somewhere in between the extremes. One such policy is to follow the direction of international price movements, but to damp the fluctuations so as not to change the real price significantly. This policy would imply, for example, that when a country expects the international price to increase by 20%, it should raise its domestic price by less than 20%, say, 5% or 10%. How much it should raise its domestic price depends, inter alia, on the degree of international price variation of the crop, the expected future price trend, the degree of risk averseness of farmers and middlemen, the costs of switching production, the political feasibility of lowering prices the following year if required, and whether the domestic price is currently above or below the international price. The amount by which the price will be raised will be different for each crop and in each country, and decisions will have to be made on a case-by-case basis while keeping the above factors in consideration.

The discussion above has concentrated on farmers, but the arguments could also be used to support consumer price stabilization, where distributional aspects would play a more important role.

**Wheat**

Wheat is the principal food crop consumed and produced. Almost all wheat is grown in the winter season. It is harvested sometime in May.
According to a study conducted by the Ministry of Food and Agriculture, 44.4% of wheat is marketed either through the Government rationshop system or in the open market. The balance is consumed by the farm family (27.3%), paid out to labour (13.2%), retained as seed (7.7%), and used for other purposes (7.4%).

The Government announces the support price in October, which is before planting begins, and keeps its procurement centres open from May through September. The Government purchases are made either by the Provincial Food Departments (PFDs) or by the Pakistan Agricultural Storages and Supply Corporation (PASSCO), in order to supply wheat to the rationshop system in urban and other food deficit areas. PASSCO agents usually come to the farms and make cash payments for purchases, whereas most farmers must transport wheat to the PFD at their own expense. Instead of selling their wheat directly to the PFD, many of the smaller farmers find it better to sell their produce at lower prices to middlemen who carry the wheat to the procurement centres, thereby avoiding high transportation costs. Others do so because of credit ties with the middlemen.

Although the procurement period is five months, about 80% of the wheat is bought in the first two months. This is because the price offered by the Government is the same in all five months and the farmer has little incentive to store the wheat at a cost to himself. There are two main reasons why the farmers even sell 20% of their wheat in the latter three months of the procurement season rather than the first two months. Some farmers with storage facilities hold onto the wheat in the hope of selling in the open

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market at a higher price. However, because they then sometimes miscalculate and overestimate the open market price, they try and cut their losses by selling in August or September to the Government. The other reason is that when the government-owned rural storage centres are full, the procurement centres discourage some farmers or middlemen from selling their wheat at the time by insisting that the wheat quality is not acceptable. In later months, when the rural storage centres have transferred some of their wheat to the urban storage facilities, the wheat is found acceptable.

The farmer (and middleman) has the option of selling his produce in the open market either directly after harvest or at any time during the year. The open market wheat comes in several different qualities (generally superior to government procured wheat). The price varies considerably throughout the year and also between regions. Private transport of wheat across provincial borders is forbidden. This implies that the open market price differs from city to city by more than can be explained by transportation costs. The average difference in the open market price between June and September during the last five years was 5.9%, which, under competitive conditions, must reflect the private cost of storage and interest. There was, however, a large variation in this figure due to uncertainty and speculation.

The wheat bought by the Government is sent to mills which mill the wheat for a commission. The mills have to pass on the same quantity of wheat flour to rationshops, and therefore they recover weight losses which result from washing the wheat by returning to the Government wheat flour with a higher moisture content. The rationshops, which are privately owned, have to sell the wheat flour to ration card holders at the same price at which they buy it. Their operating costs are covered by sales of the gunny bags in which the wheat flour is delivered. Thus the Government bears all the costs of
storage and distribution. Last year, these costs were estimated to be Rs 370/ton. Usually, the Government purchases wheat solely to supply rationshops and keep a reserve stock. Last year, however, because of a third bumper crop in a row, the Government released some wheat in the open market and exported a small quantity (50,000 tons) over land to Iran. The wheat is distributed from rural storage centres to urban areas by train and by trucks belonging to the National Logistics Cell (NLC). There is a large strain on the transport system during the months immediately following harvest.

The Government had a storage capacity of 2.8 million tons as of June 30, 1982. Last year the Government purchased 2.99 m tons of wheat. According to the findings of a World Bank team that visited Pakistan in 1980 to appraise a wheat storage project, any excess wheat was stored by (i) stacking the wheat higher than the suggested height in storage sheds, (ii) dumping loose wheat into walls made from bags stored in the storage sheds, (iii) requisitioning government schools, and other public buildings for wheat storage during peak months, (iv) leasing storage areas from the private sector, (v) putting the wheat on bricks covered with canvas, and (vi) leaving wheat out in the open. While reliable numbers are not available, losses from the latter types of storage are expected to be significant. Earlier losses from such a situation have led to an accelerated program of storage construction. By March 1985 the Government expects to have 4.0 m tons of storage capacity which because of some of the procedures followed above, will be sufficient for 5 m tons of storage.

From 1971/72 until 1979/80, Pakistan imported between 5% and 23% of its total wheat requirements. However, during the last three years, Pakistan has been self-sufficient in wheat and even exported a small amount to Iran last year. Some relevant prices and quantities are given in Table 1.
Table 1: WHEAT PRICES AND QUANTITIES 1980 - 1982

[Price figures in Rs./maund. (1 maund = 37.324 Kg.)]
[Quantity figures in million tonnes]

<table>
<thead>
<tr>
<th></th>
<th>1980 7/</th>
<th>1981</th>
<th>1982</th>
</tr>
</thead>
<tbody>
<tr>
<td>Procurement Price 1/</td>
<td>46.65</td>
<td>54.12</td>
<td>54.12</td>
</tr>
<tr>
<td>Rationshop Price 1/</td>
<td>45.16 2/</td>
<td>50.39 2/</td>
<td>61.58 2/</td>
</tr>
<tr>
<td>Open Market Price 1/</td>
<td>58.23 2/</td>
<td>63.82 2/</td>
<td>70.54 3/</td>
</tr>
<tr>
<td>Production 6/</td>
<td>10.86</td>
<td>11.47</td>
<td>11.42</td>
</tr>
<tr>
<td>Government Procurement 8/</td>
<td>2.96</td>
<td>3.99</td>
<td>2.99</td>
</tr>
<tr>
<td>Quantity Sold in Rationshop 8/</td>
<td>N.A.</td>
<td>2.77</td>
<td>2.69</td>
</tr>
</tbody>
</table>

1/ Pakistan Economic Survey, 1980/81 and 1981/82.
2/ Fiscal Year Prices.
6/ Pakistan Economic Memorandum, January 1983.
7/ The Procurement Price is announced in the late fall of the previous year, i.e. the procurement price listed in the first column was announced in October 1979, production refers to the harvest of November 1979-April 1980 and procurement refers to the period from May-September 1980.
8/ Fiscal Year Total, Ministry of Food and Agriculture.

N.A.: Not available.
Government stocks are at an all time high and are straining storage capacity. Given the 10.3% increase in procurement price announced for the 82/83 crop, it is very likely that Pakistan's wheat output will be more than sufficient to meet domestic requirements without depleting stocks. Hence, the price to use in considering whether Pakistan's domestic price correctly reflects its opportunity cost is the export parity price.

Figure 1 shows the relationship between domestic and international prices adjusted for transportation and handling. Import parity prices have been used except for the last two years when export parity prices were used. Because of the difficulty in obtaining figures for transportation and distribution costs for earlier years, percentages of relevant prices based on 1981/82 data were used. The manner in which the price comparisons were made is given in the footnotes to Figure 1. From the figure we see that domestic prices do seem to have been following international price movements and that the trend has been towards closing the gap. It is hard to say whether this has been caused by accident because real international prices have been falling or because of government concern with the comparative advantage principle.

Using the 1982/83 procurement price of Rs 1600/ton and incidentals of Rs 400/ton, the f.o.b. export cost comes out to Rs 2,000/ton or $161.29/ton at an exchange rate of Rs 12.4 to the dollar. The 1983 projected price of U.S. wheat, which is most directly comparable to Pakistani wheat, is $161.80/ton. 1/ Therefore, the two f.o.b. export prices are roughly comparable. Using the same point of comparison such as the c.i.f. price in the Middle East, Pakistani wheat would be under priced. However, the wheat

Figure 1
WORLD PRICES OF WHEAT AND PAKISTANI PRICES OF WHEAT
(1973-1982)

1973-80 Import Parity Price (US Red Winter Wheat)
World Price: f.o.b. gulf price + transportation to Karachi of
25% + distribution to local markets of 25% of procurement
price.
Domestic Price: Procurement price + 25% distribution costs.

1981-82 Export Parity Price
World Price: f.o.b. gulf price + transportation to Middle East of 25%
Domestic Price: Procurement price + 25% transportation to Karachi +
10% transportation to Middle East.
procured by the Pakistani Government is generally of poor quality, since farmers and middlemen often adulterate it before sale because government quality standards are not strictly enforced. It is, therefore, likely that Pakistani wheat will have to be sold at a discount. Thus the 1983 expected cost of exporting similar quality wheat, would be about equal to its export price.

Long-term estimates of international wheat prices show the projected 1983 price to be the lowest in real terms since 1977, but predict that wheat prices will increase by 8% in real terms by 1985 and 15% by 1990. 1/ Since it is desirable that government procurement prices are dampened versions of the expected international price movements as outlined earlier, the fact that domestic prices corrected for quality may be temporarily above the depressed world prices is in keeping with this policy. Since long-term forecasts of international wheat prices show an upward trend, correct government policy should be to increase domestic prices.

Therefore, because it is in line with international prices, the Government's current principle of raising prices in line with the increase in the cost of inputs turns out to be actually quite a reasonable policy for wheat for the next few years. This is particularly true because the Government is phasing out some of the subsidies on inputs, which will cause procurement prices to increase a little faster than the rate of inflation. However, if the international price projections turn out to be wrong and world prices do not show upward movements, the Government should be prepared to lower real domestic prices. Conversely, if the assumption of Pakistan continuing to be a surplus producer of wheat is not found to hold, the

1/ Ibid.
Government should raise real prices by more than the increase in input costs in order to move towards the higher import parity price.

Having considered price setting principles, it is now worth looking at the procurement scheme itself and asking (i) whether the objectives of the scheme are accomplished and (ii) whether the scheme could be improved.

(i) The objectives of the support scheme are to reduce annual fluctuations in price and remove uncertainty to encourage a higher production. In that the Government does not vary the producer price drastically each year and farmers do base their decision on the announced price, the government objectives are met. It does work as a true support price since prices immediately following harvest would otherwise be lower. Also, while it is true that larger farms have a larger marketable surplus and therefore would have a larger proportional gain because of the government support, it is also the case that the larger farms have storage facilities and ceteris paribus, will be more likely to sell in the open market. Hence the distributional aspects of the price support scheme are not adverse.

(ii) One problem with the current scheme is that since the Government’s procurement price is the same regardless of whether wheat is sold right after harvest or five months later, there is no incentive for farmers to store the wheat if they eventually plan to sell to the Government. This results in 70% to 80% of the wheat being sold in the first two months following harvest. The effect of this is that government peak storage requirements at the procurement centers are highest in the third and fourth months after harvest and are significantly higher than if the procurement were more evenly spread out over the five-months’ procurement period (Annex 1). In addition to the increased costs from additional storage, there is an efficiency loss in that even when farmers could store wheat more economically than the Government, they do not for the reason given above.
The suggestion, therefore, is to allow the procurement price to rise over the five-months procurement period by the marginal cost of interest and storage for the Government. In this way, the Government would be indifferent between buying the wheat earlier at a lower price or later at a higher price. The farmers would be no worse off because they still have the option of selling early at the lower price. The real net gain to society comes from the savings to Government of not needing the additional storage capacity for the peak periods. This is because some farmers who already have storage facilities will be storing additional wheat as well as other farmers who can construct temporary, low-cost, makeshift storage (brick and tarpaulin). In a situation where wheat capacity is saturated, the reduced storage requirements imply that fewer new storage facilities have to be built.

A detailed study which analyzes the marginal costs of government storage, possible farmer responses to price increases and government storage reductions is required before such a scheme is implemented. The APC is probably best suited to carrying out such a study in conjunction with the Ministry of Food and Agriculture. In addition to the above, the study would also have to find a way to minimize possible fraud whereby a storage inspector claims to have bought a certain quantity of wheat last week when, in fact, he bought it a month ago. Also, the study has to look into the possibility that the higher price will bring on large quantities of wheat from large farms who would ordinarily have sold directly in the open market. If this occurs then the assumption that total wheat purchases by the Government is unchanged would be violated.

Here a crude attempt is made to suggest the price increases and measure the savings caused by the expected decrease in peak storage requirements. The scheme proposed is one whereby the procurement price after
the fourth week of harvest is raised by about Rs 5-6 per week per ton for about 15 weeks -- this implies about a 5% increase in price over the procurement period which reflects the average increase in open market wheat price over the same period last year. A weekly increase is probably best because it captures the desired efficiency effect while being administratively manageable.

According to calculations based on the procurement profile in a major wheat growing district, Sahiwal, this would lower peak storage requirements by 10% in addition to the savings incurred by having to store wheat for a shorter time. (Annex 1.) Using Sahiwal's 10% savings in peak storage requirements and applying it to the country as a whole, it implies a reduction of 280,000 tons of new storage in June 1982. Based on World Bank storage estimates of costs of storage, this implies an annual savings of Rs 48 million (Annex 1). If Rs 5-6 per ton per week is the marginal cost of interest and storage at the existing capacity, then the Government would neither gain nor lose on the transaction by offering the higher price. The main gain to the Government would be the savings of not having to build storage amounting to Rs 48 million per year. From this must be subtracted any additional administrative costs. As mentioned earlier, farmers are no worse off -- indeed those that choose to store may be better off. Consumers of rationshop wheat flour are no worse off because the price is not changed. Consumers of open market wheat may be better off if the new system of storage results in fewer losses and hence a larger supply of wheat nationwide and lower prices. Thus this scheme leaves farmers and consumers no worse off but saves the Government about Rs 48 million per year from not having to build additional storage capacity for peak periods.
Rice

The Government sets the support price for both paddy and milled rice. However, with the exception of a few mills run by PASSCO, the Government does not buy any paddy. The paddy is sold by farmers to private mills either directly or through middlemen. As with wheat, procurement is carried out for five months following harvest. Because it is difficult for the Government to enforce it, the price paid for the paddy is typically less than the support price (except, of course, in the PASSCO run mills). However, if the price offered by the mill is significantly below the government set price, the mill would presumably be censured. Therefore, the government set price does offer some price support. After milling, the rice is sold to the PFDs of Sind and Punjab and to other authorized dealers (including mills). The PFDs keep a part of the rice for distribution during special occasions such as weddings and sell the balance to the RECP. Authorized dealers sell a portion of their rice in the domestic open markets. By law, 85% of basmati rice (it was 90% until this year) and 60% to 75% of other rice has to be sold to the RECP. Thus the PFDs and other dealers act as agents for the RECP. Despite the law, the RECP received only 36% of the total production of basmati rice last year. Apparently, the Government is not too concerned about enforcing the law as long as the procurement target set for the RECP is reached. According to a study done by the Ministry of Food and Agriculture about 55% of fine rice and 68% of coarse rice is marketed. 1/ Thirty-two percent of fine rice and 18% of coarse rice is consumed at home. The relatively low level of marketed output partly explains why the RECP only gets about 40% of total production despite a law to the contrary. However, there

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1/ A study on Utilization Pattern of Agricultural Commodities, op. cit.
is still reason to suspect that a much larger portion of basmati rice is sold in the lucrative domestic open market than the 10 percent allowed by the government.

Only two kinds of paddy are grown in Pakistan these days, IRRI-6 and basmati. Basmati rice, with its extra long grain and aromatic flavor, commands a price that is twice that of the IRRI rice. After milling, the IRRI rice is graded according to the brokenness of the grain and is polished before export. Last year the RECP made a large profit per unit of basmati rice sold, a small profit per unit of coarse rice (45% broken) and a small loss per unit of fine rice (15% broken). Some price and quantity figures for IRRI and basmati rice are given in Tables 2A and 2B, respectively.

The RECP corporation is the sole exporter of both types of rice (IRRI and basmati). Pakistan is a price taker in IRRI rices. In basmati rice, on the other hand, Pakistan has a virtual monopoly and its only rival, India, receives a lower price for its basmati rice. It is not clear whether this is due to a difference in quality or to a special relationship that Pakistan has with its clients in Muslim countries. The issues regarding the appropriate form of market structure are slightly different for IRRI and basmati, and they are, therefore, discussed separately below.

If private traders were allowed to export basmati rice, the domestic price of basmati would increase, a greater quantity of basmati would be produced and world prices would fall considerably since Pakistan faces a downward sloping demand curve in basmati rice. Annex 2 shows that an optimal policy in this case would be to levy an export tax which allows Pakistan to capture the terms of trade advantage, while producing where social marginal cost equals marginal benefit to Pakistan. A monopsony such as the RECP that captures the terms of trade advantage would sell a smaller quantity than
Table 2A: IRRI RICE PRICES AND QUANTITIES FY80-FY82
(All price figures in Rs./100 Kg)
(All quantity figures in thousand tonnes)

<table>
<thead>
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<th>1979/80</th>
<th>1980/81</th>
<th>1981/82</th>
</tr>
</thead>
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<tr>
<td>Procurement Price (Milled) 1/</td>
<td>131.28</td>
<td>157.48</td>
<td>181.22</td>
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<tr>
<td>Procurement Price (Paddy) 2/</td>
<td>87.37</td>
<td>96.45</td>
<td>112.50</td>
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<td>Export Price (FOB Karachi) 3/</td>
<td>249.17</td>
<td>327.00</td>
<td>315.08</td>
</tr>
<tr>
<td>Production 2/</td>
<td>1,859.50</td>
<td>1,676.00</td>
<td>1,891.00</td>
</tr>
<tr>
<td>Government Procurement 2/</td>
<td>754.39</td>
<td>704.64</td>
<td>693.71</td>
</tr>
<tr>
<td>Quantity Exported 4/</td>
<td>771.80</td>
<td>834.00</td>
<td>689.20</td>
</tr>
</tbody>
</table>

1/ Pakistan Economic Memorandum, January 1983.
2/ Ministry of Food and Agriculture.
4/ Classified as "other" rice, aside from Basmati. Ministry of Food and Agriculture.
### Table 2B: BASMATI RICE PRICES AND QUANTITIES FY80-FY82

(All price figures in Rs./100 Kg.)
(All quantity figures in thousand tonnes)

<table>
<thead>
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<th></th>
<th>1979/80</th>
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<th>1981/82</th>
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<tbody>
<tr>
<td>Procurement Price (Milled) 1/</td>
<td>294.72</td>
<td>342.46</td>
<td>374.83</td>
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<td>Procurement Price (Paddy) 2/</td>
<td>160.75</td>
<td>187.55</td>
<td>212.50</td>
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<td>Export Price (FOB Karachi) 3/</td>
<td>707.32</td>
<td>701.10</td>
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<td>Production 2/</td>
<td>873.90</td>
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<td>Government Procurement 2/</td>
<td>382.41</td>
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<td>Quantity Exported 2/</td>
<td>314.80</td>
<td>409.70</td>
<td>261.80</td>
</tr>
</tbody>
</table>

1/ Pakistan Economic Survey, 1981/82.

2/ Ministry of Food and Agriculture.

private traders because its marginal cost is higher than the social marginal cost. Of course, appropriate policy by the Government which fixes the procurement price for rice at a higher level could achieve the optimal price quantity combination too. While it is difficult to measure precisely, it is quite possible that this is in fact the situation in Pakistan already, because RECP's efforts to keep prices low are thwarted somewhat by farmer interest groups' efforts to raise prices.

The only other concern, then, is whether the government-owned enterprise runs efficiently. It is difficult to ascertain this. However, a point in its favor is that there are no major complaints about the efficiency of the rice export corporation, although it is true that any incentives to innovate and find new markets are much less than they would be in the private sector. Despite the latter point, there are three sound reasons against permitting the private sector to export basmati rice. The first is that it would be as difficult to determine the optimal export tax as it would be to determine the equivalent price to farmers that would optimize country welfare. The second reason is that a such a tax invites corruption. There would be huge incentives in trying to pass off basmati rice as IRRI. Finally, since the optimal price would change from year to year, export tax rates would have to change accordingly. It is administratively and politically easier to change the price at which the RECP buys from farmers than to change the export tax rate. Thus the conclusion here is to let the market structure and pricing policy stay as is.

It is more difficult to justify disallowing the private sector to compete in IRRI rices. As before there are two points which argue for private sector involvement in the export of rice. The first is that the private sector has greater incentives to be more efficient. The second is that a
monopsonist such as the RECP would purchase a smaller quantity of rice at a lower price than a firm in competition because its marginal cost curve is higher than society's cost of producing the rice. In the past, IRRI rice prices have been well below international levels (Figure 2). An analysis of the current situation in Pakistan, fortunately, shows that the latter phenomenon does not occur to any serious extent. The small unit profits made on IRRI rices by the RECP last year suggests that the RECP did not make monopsonistic profits. In addition, the increases in prices on IRRI paddy announced for next year's crop are very close to the nominal percentage increase in the international price of rice predicted by the World Bank (percentage price increases in domestic milled rice, however, were lower). The current structure of prices and the direction of change are in line with world price levels. International price forecasts predict a 26% real increase in rice prices over the next two years after which the price is expected to remain constant in real terms. Following the policy of dampened changes in prices, the Government should increase the real price of rice by less than 26% -- the 13% increase in paddy price announced last year comes closer to the target, but the 7% to 10% increases in milled rice prices are puzzling, unless the Government felt that millers were making higher than normal profits.

Despite the fact that the RECP is not able to set prices in a monopsonistic fashion and that it appears well managed, justifications for keeping the private sector out of IRRI trade are still not evident. One possible reason is that private sector involvement could lead to smuggling of basmati rice under the guise of IRRI. Based on the available information, the case is not clear-cut. The conclusion is that if the Government believes that basmati exports can be successfully restricted to the RECP, the private sector should be allowed to compete with the RECP in the export of IRRI rices.
Figure 2

WORLD PRICES OF RICE AND PAKISTANI PRICES OF RICE
(1973-1982)

World Price: 75% of Thai 5% broken f.o.b., Bangkok.
Domestic Price: Procurement price + 35% incidentals to port.
However, even if the Government decides not to allow private sector competition, some incentives should be given to the RECP to explore new markets and consider the possibility of entering into forward contracts where both price and quantity are negotiated beforehand. Currently, the RECP does occasionally enter into forward contracts but decides only on the quantity — the price is determined with reference to an international spot price at the time of delivery.

Cotton

The Government sets both the price of seed cotton as well as the price of lint cotton. As with rice, farmers sell their seed cotton to private ginning factories, either directly or through middlemen. With the exception of a few model ginning factories run by the CEC, the seed cotton fetches a slightly lower price than that fixed by the Government, because of enforcement difficulties. The ginning factories separate the seed cotton into lint and seed. The lint is sold either to the CEC or directly to textile mills at a fixed price. The seeds are taken to oil expellers who extract the oil and sell it to the Ghee Corporation of Pakistan (GCP), also at a fixed price. The CEC stores the cotton and sells it both in the domestic market and in the international market.

The CEC is the sole agency in Pakistan which is allowed to export cotton. Until 1973, all trade in cotton was in the hands of the private sector and Karachi had a very active international futures market. The dramatic increase in cotton price in 1973 led many private traders to default on their contracts which led to government intervention in cotton trading. In 1976/77, because of a world-wide slump in cotton prices, the Government decided to start supporting the price of both seed cotton and lint. Table 3 gives data on prices and quantities in the cotton sector.
The issues facing cotton are very similar to those facing rice in that cotton is a major export and all exports are handled by the government-owned agency. The major differences are that Pakistan does not have a monopoly on any kind of cotton, and the CEC is not solely an export corporation, but it also buys cotton for the domestic market, possibly to stabilize prices. There are complaints from the textile industry that the CEC does not always deliver cotton to them at the right time and sometimes arbitrarily raises the price on large orders.

Until the government takeover in 1972/73, cotton trading had been entirely in the hands of the private sector. CEC's monopoly in cotton trading came about because the private sector reneged on forward contracts in the international futures market. Private traders reneged on their forward contracts because they had promised to deliver large quantities at a low price. When spot prices rose dramatically, they were unable to buy cotton at low prices and would therefore have suffered unacceptable losses. They preferred to take the consequences of not meeting their obligations. The official reasons given for the government takeover were along the lines that the private sector's failure to honor its contracts implied that international confidence in Pakistan's cotton traders had broken down and government intervention was needed. In fact, the lucrative profits to be made from the prevailing cotton prices must also have been an incentive. The answer to the problem could also have been addressed by regulating trade (requiring larger margins, etc.) and would probably have been better for the country in the long-run. Finally, it is even less clear why the CEC stepped in to procure cotton for domestic textile mill consumption. One reason may have been to stabilize prices.
Table 3: COTTON PRICES AND QUANTITIES FY80-FY82
(All price figures in Rs./100 Kg.)
[All quantity figures in thousand tonnes (converted at 375 lbs. = 1 bale)]

<table>
<thead>
<tr>
<th></th>
<th>1979/80</th>
<th>1980/81</th>
<th>1981/82</th>
</tr>
</thead>
<tbody>
<tr>
<td>Procurement Price AC-134, NT (^1/)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lint</td>
<td>1,026.15</td>
<td>1,106.52</td>
<td>1,122.49</td>
</tr>
<tr>
<td>Seed Cotton</td>
<td>369.74</td>
<td>400.01</td>
<td>424.98</td>
</tr>
<tr>
<td>Export Price (Staple) (^2/)</td>
<td>1,326.22</td>
<td>1,596.83</td>
<td>1,267.25</td>
</tr>
<tr>
<td>Production (^1/)</td>
<td>728</td>
<td>715</td>
<td>748</td>
</tr>
<tr>
<td>Government Procurement (^3/)</td>
<td>384.69</td>
<td>258.33</td>
<td>235.54</td>
</tr>
<tr>
<td>Domestic Consumption (^3/)</td>
<td>400.34</td>
<td>407.65</td>
<td>459.18</td>
</tr>
<tr>
<td>Quantity Exported (^3/)</td>
<td>251.02</td>
<td>324.66</td>
<td>231.12</td>
</tr>
</tbody>
</table>

\(^1/\) Pakistan Economic Survey, 1981-82.


\(^3/\) Planning Division, Ministry of Finance.
After the big slump in cotton prices in 1975/76, the Government decided to start supporting the cotton price to protect farmers from price and income fluctuations as well as to encourage cotton production. The prices for different varieties of cotton have only been raised by 15% to 25% in nominal terms over the last five years. The prices of rice and sugarcane, which are its chief competitors for acreage, have risen by two to three times that amount. However, the small increase for cotton is justified because international cotton prices have barely increased over this period. (One advantage of the CEC's existence is that the Government is less likely to allow support prices to get higher than international prices since this would involve subsidizing the CEC.) But, the international outlook for the next two or three years is for substantially higher prices and the Government's recent decision to raise seed cotton prices by only 2.6% and keep lint prices constant may have been an over-reaction to the low 1982 price. In setting the procurement prices the Government should look ahead towards future expected prices, rather than the losses made in any one year due to a temporary slump in price.

Sugar

The marketing of sugar is fairly complicated. The Government fixes the price of both sugarcane and refined sugar. According to the study on Utilization Patterns of Agricultural Commodities, conducted by the Ministry of Food and Agriculture, 93% of all sugarcane is marketed. In 1981/82 from a total of 36.5 m tons, 14.6 m tons (40%) was sent to the factories to be converted to sugar. The balance was made into gur, a sweetener that is obtained by extracting the juice and heating it until it solidifies. The process is conducted at the farms and gur is the preferred sweetener in rural
areas. The entire marketing of gur is handled by the private sector and the price is free to vary with market forces.

The marketing of sugar, however, is strictly controlled by the Government. With the exception of small quantities of beet grown in the NWFP at slightly higher prices, the supply of sugar comes from sugarcane. Sugarcane growers in designated mill zones have to supply their entire output to the sugar mill at a fixed price. Outside the mill zone, they are free to sell in the open market for sugar or gur. In addition to receiving a fixed price, farmers who sell to the government receive 15 kg of sugar for every ton sold to the mill. The price varies very slightly in the three sugar growing provinces and the variation is based on average provincial recovery rates some years ago. The mills have to sell their entire output to the PFDS at a fixed price which varies according to when the sugar mill was constructed. However, if their production has exceeded the last three years' average, they are allowed to sell 50% of the excess in the open market. Figures on prices and quantities for sugar are given in Table 4.

Most of sugar is sold at subsidized prices through the same rationshops that sell wheat. The Government incurs all the distribution and storage costs. Currently, the Government has huge surpluses of sugar and is considering exporting some of the surplus. However, in order to export their sugar, they would have to sell at a price which is almost one-quarter of their cost.

International sugar prices rose by 24% from 1979 to 1980 and then tripled in 1981. The Government of Pakistan, which imported a large quantity of sugar in 1979/80, reacted by raising the procurement price of sugarcane by 22% in 1979/80 and 28% in 1980/81 in order to encourage an increase in production. Until the 22% increase, the procurement price had been unchanged.
Table 4: SUGAR PRICES AND QUANTITIES FY80-FY82
(All price figures in Rs./100 Kg.)
(All quantity figures in million tonnes)

<table>
<thead>
<tr>
<th></th>
<th>1979/80</th>
<th>1980/81</th>
<th>1981/82</th>
</tr>
</thead>
<tbody>
<tr>
<td>Procurement Price (Sugarcane-Millgate) (^1/)</td>
<td>18.75</td>
<td>24.11</td>
<td>24.11</td>
</tr>
<tr>
<td>Rationshop Sales Price (Sugar) (^1/)</td>
<td>459.98</td>
<td>597.00</td>
<td>697.00  (^2/)</td>
</tr>
<tr>
<td>World Sugar Price (ISA Daily, FOB and Stowed Main Caribbean Ports)</td>
<td>625.68 (^3/)</td>
<td>370.26 (^3/)</td>
<td>265.59 (^4/)</td>
</tr>
<tr>
<td>Production (Sugarcane) (^1/)</td>
<td>27.50</td>
<td>32.36</td>
<td>36.60</td>
</tr>
<tr>
<td>Production (Sugar) (^5/)</td>
<td>0.57</td>
<td>0.85</td>
<td>1.30</td>
</tr>
<tr>
<td>Sugarcane Crushed (^5/)</td>
<td>5.80</td>
<td>9.10</td>
<td>14.60</td>
</tr>
<tr>
<td>Quantity Sugar Consumed (Rationshop) (^5/)</td>
<td>0.70</td>
<td>0.76</td>
<td>0.85 (^6/)</td>
</tr>
</tbody>
</table>

\(^1/\) Pakistan Economic Survey, 1981/82.
\(^2/\) July-March.
\(^3/\) Calendar year prices, Price Prospects for Major Primary Commodities, World Bank Report No. 814/82, July 1982.
\(^4/\) Pakistan Economic Memorandum, January 1983. Support Data for Table II.6.
\(^5/\) Ministry of Food and Agriculture.
\(^6/\) Estimated.
for three years. By 1982, the world price of sugar had dropped to 40% of its 1980 level. In keeping with its price stabilization policy, the Government reacted by not changing its nominal price. As anticipated, domestic production increased until sugar imports became unnecessary. And, Pakistan now finds itself in a situation where it has large stocks of surplus sugar which it can only export at a substantial loss.

The sugar situation is a vivid example of how one cannot expect the Government to both set a procurement price which reduces variance in prices to the farmer and yet have the procurement price reflect the international price. Critics who favor support prices, yet charge that sugar prices have been set at too high a level, have missed the whole point of price stabilization. It is not feasible to keep close to international prices when they triple one year and drop to two-fifths their level of two years ago and yet follow price stabilization.

An argument could be made that the Government's increase of 28% was a little too high given that it came on the heels of a 22% increase a year earlier. But, it is difficult to ascribe much blame to the Government when one realizes it reacted to a 200% increase in world prices. The Government's decision not to raise the nominal price during the last season and the next one is sound. Reducing the price is politically difficult and would bear high adjustment costs because the sugar crop in Pakistan is a three-year crop. That is, it makes economic sense to replant only after three years. In any case, according to World Bank forecasts, the sugar price is expected to rise by 20% in 1983 and 89% by 1985. 1/ Keeping the price of sugar constant for another one or two years and then raising it by the rate of inflation would

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cause it to hit world prices in about three or four years if the World Bank forecasts prove accurate. This is probably the best policy.

The Government appears to be following a sensible pricing policy in sugar. If, in fact, the Government had followed a cost-plus policy for the procurement price and raised the rationshop price by the same percentage, this would have required raising the sugar price by the inflation rate of 10%. A crude analysis on welfare gains and losses based on concepts of producer surplus, consumer surplus and changes in government revenue is conducted in Annex 3. The results suggest that the loss to the Government from the increased price would have been Rs 437 million, the loss to rationshop consumers Rs 597 million, and the gain to farmers Rs 863 million.

Under the current procurement system, farmers are paid a price which is dependent only on the weight of the cane. There is a suggestion to link the price paid to the farmer with the sucrose content of his cane; however, the country does not possess the testing equipment needed to do this. In lieu of this there is a suggestion to base the price paid to the farmer on the recovery rate of the mill. However, this gives precisely the wrong incentives to the mills to increase recovery rates and little incentive to the farmer to increase the sucrose content of his cane. The former suggestion of linking price to the sucrose content needs to be explored further, but the latter suggestion regarding recovery rates should be discouraged.

CONCLUSIONS

The movements in the level of government set prices over the last ten years have been in keeping with their price stabilization objectives while generally keeping in mind comparative advantage considerations as reflected by
international prices — that is, the directions of change have reflected changes in international prices. Except for sugar whose international price has been very unstable, output prices are now close to international levels while subsidies for inputs are declining. It is not clear whether this outcome is a result of deliberate government policy or simply an ad hoc outcome of falling international prices and increasing costs. In some cases at least (e.g., cotton, and to some extent, sugar), it is clear that the Government has not ignored international price signals. On the other hand, the cost based principle used by the Government is not economically sound and has serious measurement problems. Therefore, it would be useful to more explicitly introduce into the government pricing decision a principle whereby the domestic price is changed according to expected changes in world prices. The setting up of the APC is progress towards streamlining the past ad hoc approach.

Based on an analysis of price trends and the workings of agricultural markets in Pakistan, the principle of following the country's comparative advantage while simultaneously stabilizing prices would suggest the following conclusions:

(1) A study which analyzes the possibility of raising the procurement price of wheat by the marginal cost to the Government of interest and storage needs to be conducted. A crude exercise suggests that if such a policy succeeds in spreading out procurement, then savings to the Government from not having to build additional storage for peak periods would amount to about Rs 48 million annually. In addition, both farmers and consumers are expected to be at least as well off as under the previous arrangement.

(2) The procurement price of wheat is currently at the international price level adjusted for transportation and handling costs and
ought to be changed gradually every year in line with international trends. Since international price projections expect the wheat price to increase gradually in real terms, a policy of allowing wheat prices to increase by the cost of production would be satisfactory. If, however, international wheat prices do not increase as envisaged, the wheat price should not be increased accordingly.

(3) Exports of basmati rice should be left to the RECP because the alternative of permitting private sector competition while imposing an export tax promotes problems such as deciding on the level of the tax and invites corruption.

(4) If the ban on the export of basmati rice by the private sector can be enforced, the private sector should be allowed to compete with the RECP in the exports of IRRI rices.

(5) The IRRI rice price should be raised a little more than last year's increase in order to stay in line with long term international price trends.

(6) The RECP should be encouraged to be more innovative in exploring new markets and to consider the possibility of entering into forward contracts.

(7) The Government should consider allowing the private sector to compete with the CEC in cotton exports. If so, private sector trade should be regulated to avoid a repeat of the 1972/73 performance. The CEC should play a smaller role in acting as a middleman for domestic consumers.

(8) Since world cotton prices are expected to increase during the next two or three years, the Government ought to raise cotton prices so as to give farmers and ginners an incentive to produce more.
(9) The procurement price of sugar should be unchanged for another one or two years, after which it should be increased in line with inflation if international prices increase as forecasted. This policy is expected to bring the domestic price in line with world price. The Government’s decision not to increase the sugar price during the last two years should be commended. If the Government had decided to increase the sugar support price by 10% this year and had increased the rationshop price correspondingly, the loss to the Government would have been Rs 437 million, the loss to the rationshop consumers Rs 597 million and the gain to farmers Rs 863 million (Annex 3).

(10) The possibility of linking the price paid to the farmer on the sucrose content of his cane should be explored further, but the proposal suggesting linking the procurement price to the recovery rate of the mill should be discouraged.
Annex 1

PAKISTAN

AN ANALYSIS OF AGRICULTURAL PRICING POLICY

Purpose: To show the savings to the Government from reduced storage requirements by following a policy that spreads out procurement.

First the effect on peak storage needs of a change in the procurement profile will be calculated. This is done by looking at a typical procurements and shipments profile in a wheat growing district of Punjab (Sahiwal). The data are taken from the appraisal report of the World Bank Grain Storage Project of Pakistan.

In Table 5, the ending inventory is given by the sum of last period's inventory and the difference between procurements and shipments. The actual storage requirements during the peak period are 371. Alternative (1) reduces the peak requirement to 335 (a reduction of 10%) by spreading procurement evenly throughout the five months. (This may be accomplished by offering the farmer a higher price on wheat sold in later months.) Alternative (2) shows that the 10% reduction could even by achieved by a less ambitious scheme — one that shifts only slightly the procurements of May and June into later months.

Since the total storage capacity for wheat in the country as of June 1982 is 2.8 m tons, 280,000 tons less of storage capacity is needed assuming that the total quantity procured by the Government over the 5-month period would be the same as without this scheme. Assuming that this storage results in 11 fewer facilities of the 1,100 ton capacity, 13 fewer of the 4,400 ton capacity and 12 less of the 17,600 ton capacity and using World Bank estimates of the operating costs of these facilities, the savings in operating costs are Rs 14.246 m in 1979/80 rupees or Rs 17.804 m in 1981/82 rupees. In addition, there are fixed construction costs of these facilities of Rs 303.904 m in 1981/82 rupees. Assuming a conservative discount rate of 10% and a storage shed life of 25 years, this represents an annual equivalent cost of Rs 30.158 m. Thus the total annual savings from not building the 10% additional storage is given by Rs 47.962 million.
Table 5: WHEAT STORAGE REQUIREMENTS

<table>
<thead>
<tr>
<th>Month</th>
<th>Procurement Profile</th>
<th>Shipments to Food Deficit Areas</th>
<th>Ending Inventory</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Actual</td>
<td>Alt. 1</td>
<td>Alt. 2</td>
</tr>
<tr>
<td>Beginning Inventory: 70</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>May</td>
<td>186</td>
<td>93</td>
<td>150</td>
</tr>
<tr>
<td>June</td>
<td>186</td>
<td>93</td>
<td>150</td>
</tr>
<tr>
<td>July</td>
<td>65</td>
<td>93</td>
<td>75</td>
</tr>
<tr>
<td>August</td>
<td>14</td>
<td>93</td>
<td>45</td>
</tr>
<tr>
<td>September</td>
<td>14</td>
<td>93</td>
<td>45</td>
</tr>
</tbody>
</table>
Annex 2

PAKISTAN

AN ANALYSIS OF AGRICULTURAL PRICING POLICY

Purpose: To show that an export tax is optimal for a country which has a monopoly in its export product.

In Figure (iii), DD is the foreign demand curve for the export good, MR the corresponding marginal revenue curve, and MCg the supply curve which is the cost to society of providing an additional unit of the good. Since the only revenue accruing to the country is given by the area under the MR curve while the cost to society of providing the good is given by the area under the MCg curve, the quantity that maximizes net revenue is OQo where MCg = MR. In order to induce farmers to produce no more than OQo the Government must levy an export tax given by BG. The international price will be Po1 and the price to farmers Pof. ABCD will be the total tax revenue collected and the area above MCg and below Pof will be the producer surplus.

A monopsonist in a similar situation would have a marginal cost curve MCm that is higher than MCg because in order to buy an additional unit, the monopsonist has to pay the additional cost not only on the last unit, but on all units of the good. The monopsonist maximizes profits at Qm where MCm = MR. He offers a price Pmf to farmers and sells the good at Pmf. His revenue is given by GRJK. The net loss to society in this case as compared to the optimal tax situation is given by the shaded triangle RCJ.

Free trade with perfect competition implies that Q* will be produced and sold in the international market at the low price P*. The reader can verify that the benefit from trade under this situation is given by the gain in the optimal tax case less the area of triangle CST. The gain under monopsony is greater than under free trade with competition insofar as the area of triangle RCJ is less than that of triangle CST.
Figure (iii)

OPTIMAL EXPORT TAX VS. MONOPSONY
Annex 3

PAKISTAN

AN ANALYSIS OF AGRICULTURAL PRICING POLICY

Purpose: To calculate the change in welfare of different interest groups from reducing the real procurement price and rationshop price of sugar by 10%.

If the Government were to increase the procurement price based on the cost-plus approach, the sugar price would go up by 10% in nominal terms or remain constant in 1981/82 rupees assuming an inflation rate of 10 percent during FY83. Therefore, a policy of not changing the nominal price implies a 10% decrease in 1981/82 rupees.

Data for 1981/82 in Million of Tons

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sugarcane produced</td>
<td>36.5</td>
</tr>
<tr>
<td>Cane crushed in mills</td>
<td>14.5</td>
</tr>
<tr>
<td>(i.e., 60% of cane diverted to gur)</td>
<td></td>
</tr>
<tr>
<td>Sugar produced</td>
<td>1.3</td>
</tr>
<tr>
<td>Sugar sold in rationshop</td>
<td>0.853</td>
</tr>
<tr>
<td>Government sugar stocks</td>
<td>0.22</td>
</tr>
<tr>
<td>Average ex-mill price of sugar</td>
<td>Rs 7339.80/ton</td>
</tr>
<tr>
<td>Rationshop price of sugar</td>
<td>Rs 7000/ton</td>
</tr>
</tbody>
</table>

Assumptions

1. Proportion of sugarcane diverted to gur is unchanged.
2. Decrease in production of sugar is matched perfectly by a decrease in government stocks of sugar.
3. Government could import sugar to replenish stocks — i.e., the opportunity cost of stocks released is Rs 4330/ton.
4. Government handling and distribution cost of sugar is 25% of ex-mill price.
5. The lower rationshop real price does not lead to increased demand because the number of ration cards is fixed.

The loss to farmers from a lower real price depends on the elasticity of marketable surplus. Using the concept of producer surplus
to measure the welfare of farmers, the table below shows the losses to farmers under different elasticity assumptions. The most likely scenario based on empirical studies is one when the elasticity is 0.4. However, it is encouraging to see that the total loss is not very dependent on the elasticity used:

<table>
<thead>
<tr>
<th>Elasticity</th>
<th>Loss in Producer Surplus in Millions of Rupees</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1</td>
<td>875.724</td>
</tr>
<tr>
<td>0.2</td>
<td>871.323</td>
</tr>
<tr>
<td>0.3</td>
<td>866.923</td>
</tr>
<tr>
<td>0.4</td>
<td>862.522</td>
</tr>
<tr>
<td>0.5</td>
<td>858.121</td>
</tr>
<tr>
<td>0.6</td>
<td>853.721</td>
</tr>
<tr>
<td>0.7</td>
<td>849.320</td>
</tr>
</tbody>
</table>

The gain to consumers from a 10% decrease in the rationshop price is given by the change in price times quantity since it is assumed that the number of ration cards is fixed. The gain is given by:

\[(0.853 \times 7000) - (6300 \times 0.853) = Rs\ 597.1 \text{ million.}\]

The savings to Government stem from two sources: (1) the subsidy per ton of sugar is 10% less in real terms, and (2) the opportunity cost of the decrease in stocks is lower than the cost of producing sugar domestically.

1. The 10% savings in rationshop subsidy are given by

\[(7339.8 \times 1.25 - 7000) \times 0.853 \times 0.1 = Rs\ 185.51 \text{ million.}\]

2. The gain from having to procure a smaller quantity of domestic sugar is equal to the difference between the cost of domestic sugar and imported sugar times the decrease in sugar stocks.

Assuming an elasticity of marketable surplus of 0.4 and assumptions (1) and (2) above, the decrease in Government stocks is 0.052 m tons. At an opportunity cost of sugar of Rs 4330/ton (the imported cost), the gain to the Government is given by:

\[(7339.8 \times 1.25 - 4330) \times 0.052 = 251.93 \text{ m tons}\]

Therefore, the total gain to the Government is Rs 437.44 million.

[Note, there are two other interest groups who have not been considered here because of difficulty of measurement problems. They are (a) the sugar mills who would lose about 4% of their earnings and (b) consumers of gur who would gain from lower prices as a result of lower sugarcane price.]