

Autarky in Food: Evidence and Prospects

M. GHAFAR CHAUDHRY*

I. INTRODUCTION

Without going into details which have been discussed elsewhere [5, pp. 1-4], we would like to emphasize the importance of self-sufficiency in food in terms of its direct contribution to more judicious use of domestic resources and economic development, reduction of risks associated with dependence on world food market, enhanced welfare of consumers and producers, and, above all, saving of foreign exchange [7, p. 263]. The present paper examines Pakistan's prospects of attaining this goal. Since Pakistan's programme of self-sufficiency in food has been synonymous with wheat self-sufficiency [25, p. 1], this paper focuses on wheat alone. In line with its objective, the present paper is divided into four sections. Section II reviews Pakistan's achievements in self-sufficiency in wheat, beginning with the early Fifties. In Section III, the emphasis is on Pakistan's prospects of maintaining self-sufficiency in wheat. Section IV summarises the conclusions and recommends policies for the future course of action.

II. A REVIEW OF SELF-SUFFICIENCY IN WHEAT

Pakistan at the time of independence, was basically a wheat-surplus area [16, p. 20] and food deficits were unheard of in Pakistan until 1952 despite the falling wheat output and growing population. In the period that followed, however, Pakistan faced persistent wheat shortages, rising wheat imports and mounting financial burdens. It was the growing acuteness of these problems that self-sufficiency in wheat remained a goal of development planning in and after 1960. In reviewing Pakistan's progress in this respect, this section compares the intertemporal trend of wheat output with wheat consumption for necessary inferences. In the absence of

*Dr. Chaudhry is Chief of Research (Economics) at the Pakistan Institute of Development Economics, Islamabad. The present paper is a shortened version of an earlier paper of the author presented at the First Annual General Meeting of the Pakistan Society of Development Economists, held at Islamabad from March 17 to March 20, 1984.

the relevant data, wheat consumption in any one year was estimated with the following formulation:

$$C_t = W_{t-1} + (M_t - X_t) + (D_t - A_t)$$

where

C_t refers to actual wheat consumption during any year "t",
 W_{t-1} equals wheat output for the year preceding "t",
 $(M_t - X_t)$ represents wheat imports net of exports during the year "t", and
 $(D_t - A_t)$ is the depletion of or addition to government wheat stocks.

Based on the above formulation, Table 1 presents Pakistan's status with regard to self-sufficiency in wheat for certain selected years.

Table 1

Wheat Production, Wheat Consumption and Degree of Wheat Self-Sufficiency in Pakistan for Selected Years*

Years	Wheat Production (000 M Tons) Previous year	Wheat Consumption (000 M Tons)	Degree of Self- Sufficiency (Percent)
1949-50	4038	4038	100.00
1954-55	3654	3654	100.00
1959-60	3907	4724	82.71
1964-65	4162	5678	73.80
1969-70	6618	6849	96.63
1974-75	7629	8906	85.66
1975-76	7673	8565	89.58
1976-77	8691	9198	94.49
1977-78	9144	10510	87.00
1978-79	8367	10413	80.35
1979-80	9950	10246	97.11
1980-81	10857	10826	100.29
1981-82	11475	11284	101.69
1982-83	11142	10945	101.80

Source: Adopted from [5, p. 8].

*Degree of self-sufficiency is the percentage of wheat consumption met from domestic wheat production.

It is clear from Table 1 that Pakistan enjoyed varying degrees of self-sufficiency in wheat in various years of the period under consideration. From 1949-50 to 1954-55, Pakistan remained wheat-surplus as is evidenced by the fact that during that period it imported very little wheat, perhaps mainly for reserve. Pakistan's self-sufficiency in wheat was considerably weakened between 1954-55 and 1964-65: domestic wheat output accounted for only 82.71 percent and 73.30 percent, respectively, of the total wheat consumption requirements in 1959-60 and 1964-65. The bumper wheat harvest of 1967-68, thanks to the Green Revolution, led to a drastic reduction in wheat imports – from 1.44 million tons in 1967-68 to only 16,000 tons in 1968-69 [20, p. 248]. Although this new development promoted official [21, p. 261], [26, p. 4] and unofficial [10, p. 331] optimism for Pakistan's entry into wheat exports, the self-sufficiency status achieved in 1968-69 was short-lived as dependence on imports began to grow again: in 1974-75, more than 14 percent of Pakistan's wheat requirements were met by imports. Although dependence on imports from 1975-76 to 1977-76 was somewhat lower, wheat imports reached a record figure of 2.24 million tonnes worth Rs. 3.5 billion in 1978-79. In the subsequent years, Pakistan's wheat production exceeded wheat consumption and resulted in wheat exports and accumulation of wheat stocks [14, p. 66].

Although, for want of data, it is not possible to identify all the factors that helped Pakistan to achieve self-sufficiency in wheat in and about 1950, it is interesting to compare the mechanics of the self-sufficiency in wheat in the late Sixties with that in the early Eighties. Firstly, the self-sufficiency in the Eighties was accompanied by critical shortages of edible oils and pulses which, of course, were not present in 1968-69. This situation was caused by the then exclusive emphasis of the government policy on wheat. Secondly, the self-sufficiency in 1968-69 was achieved by a sharp increase in wheat output and was accompanied by rapid increase in wheat consumption. By contrast, the early Eighties were characterised by modest output increases and stagnating wheat consumption. This implies that at the current population growth rate of 3.0 percent per annum, self-sufficiency in wheat, wheat exports and build-up of buffer stocks in the Eighties were largely the result of falling per capita wheat consumption. On the basis of the available empirical evidence for the period under consideration, it is possible to conclude that while the per capita wheat consumption in the Sixties increased at the rate of 3.5 – 10.7 percent per annum, that in the Eighties actually fell at the rate of 1.2 – 4.3 percent per annum [5, p. 13]. In view of the continuous rise in per capita incomes and the insignificant substitution of other foodgrains and animal products for wheat, the fall in the per capita wheat consumption appears to be paradoxical, but strict government control of the wheat market, through its monopoly of procurement, and a tight wheat-stock release policy may well be responsible for this fall.

III. PROSPECTS OF SELF-SUFFICIENCY

Pakistan appears to have become self-sufficient in wheat in recent years. As reflected by the data in Table 1, the growth of wheat production between 1949-50 and 1982-83 has slightly been in excess of the growth of wheat consumption. Assuming that this long-term trend could be maintained, prospects of maintaining self-sufficiency in wheat in the future appear to be good. These prospects will be considerably brightened if the government will continue its policy of restricting wheat consumption. But, then, an indefinite continuation of such a policy may be neither possible nor desirable, for, by restricting wheat consumption, the government would create a large unsatisfied demand for wheat, which, apart from clashing with the objective of attaining self-sufficiency in wheat, will raise wheat prices, thereby causing inflation, and create political unrest in the country, especially because rising incomes will tend to further raise the consumers' demand for wheat as a staple food.

On *a priori* grounds, changes in the growth of consumption of a staple food commodity like wheat may be taken to be the function of changes in the commodity's own price relative to the prices of its close substitutes, rate of growth of population, trend of income distribution, growth of per capita income and the grain's amount required for seed and feed [10, p. 323, and 26, p. 3]. Although population growth rate, income distribution and seed requirements are unlikely to change significantly, wheat consumption growth rates may well be considerably higher in the future than those in the past owing to changes in other factors.

For example, against the long-term realized growth rate of 2.16 percent, the target of the Sixth Five-Year Plan is an annual growth of 3.5 percent in per capita income. At the prevailing 0.5-percent income elasticity of demand for wheat, the annual growth rate of wheat consumption is likely to accelerate from 1.08 percent to 1.75 percent for this factor alone. Also, there is an increasing possibility of greater substitution of wheat for other food grains because of the stagnating production, and the consequently reduced availability and higher prices of the other food grains. At the present level of Pakistan's development, the importance of consumption and production of livestock products is likely to rise and create a greater demand for wheat as feed for livestock [12, p. 242, and 26, p. 3]. Also important in this respect is Pakistan's objective of generating significant wheat surpluses for export in the near future.

From the foregoing, it is not difficult to see that wheat consumption in the future will increase at the rate of well above 5.0 percent per annum and that wheat production will have to grow at precisely the same rate to permit a sustainable self-reliance. The question then arises whether it would be possible for Pakistan to realize a yearly growth rate of wheat output exceeding 5.0 percent in the future.

If we look at Pakistan's past performance in wheat production, we find that during the 33-year period under consideration, wheat output grew at an annual rate of only 3.35 percent. If, on the basis of this long-run growth rate, one were to assess Pakistan's prospects of achieving the target growth rate of over 5 percent, one would find them rather dim. But, then, it is also a fact that during the 15-year period between 1964-65 and 1979-80, Pakistan had achieved a wheat-output growth rate of 6.0 percent per annum, thanks essentially to the cultivation of high-yielding varieties (HYVs) of wheat. It is thus manifest that if Pakistan wishes to achieve a wheat-output growth rate of more than 5 percent per annum, it should intensify the cultivation of HYVs of wheat. An expansion of the area devoted to wheat in the country would be of additional help in this regard.

Is it profitable to expand the wheat area in Pakistan? Under the present conditions, No; for wheat prices are lower than those of other food grains. To induce farmers to bring additional area under wheat cultivation, it will be necessary to maintain higher wheat prices relative to the prices of other crops. Even if this is done, it may not turn out to be such a wonderful solution, for it may have adverse effects on the national economy. For example, it may (i) result in a shrinking of the area under other crops, leading to their shortages, (ii) somewhat reduce the already unsatisfactory food consumption of the low-income groups, (iii) exacerbate income inequalities by causing the low-income groups to pay more for the wheat purchased from the marketable surpluses of the high-income groups, and (iv) reduce Pakistan's ability to compete in the international wheat market [5, p. 27].

In view of the above limitations, Pakistan must, in the main, depend on exploitation of the unrealized yield potential of the high-yielding varieties of wheat, both existing and to be evolved, and there seems to be a considerable scope for it. For example, it has been argued in a number of studies that the actual wheat yields in Pakistan are only 30-40 percent of the possible yields of the existing HYVs of wheat [9, p. 406; 13, p. 12; and 24, pp. 1-5]. One of the implications of these figures is that wheat output in Pakistan could be more than doubled or trebled by simply tapping the yield potential of the existing varieties. The possibility that new HYVs of wheat may be evolved in the future promises even higher growth rates of wheat output in Pakistan.

The successful exploitation of the as yet unrealized yield potential of the existing HYVs of wheat and the potential to be created in the future is, however, constrained by a number of factors. The studies on yield constraints, referred to above, all agree that low fertilizer-application rates are among the principal causes of low actual wheat yields, with poor water management, low quality seeds, inadequate plant protection measures, prevalence of water-logging and salinity and the continuity of outmoded cultivation practices being the other major causes. It may be reiterated that while the actual fertilizer-application rates are only 35 percent and

about 20 percent of the respective recommended rates in irrigated and unirrigated areas [22, p. 30], the low rates of fertilizer application account for as much as 60 percent of the unrealized wheat-yield potential [24, pp. 1-5]. It follows that the realization of the untapped wheat-yield potential would not be possible without greatly stepped-up use of modern key inputs and practices.

The use of modern inputs and practices may in general be promoted by extension agents, mass media, institutional credit and by increasing their profitability. It may, however, be pointed out that the success of these approaches would in the ultimate analysis, be determined by their demonstrated profitability. It has, for example, been averred that when the price of fertilizer is far above the prices of farm products no extension programme can induce farmers to use additional quantities of fertilizer [23, p. 45]. It has similarly be remarked by Johnston and Connie that application of chemical fertilizers would undoubtedly increase unless there is a marked deterioration of grain-fertilizer price ratios [8, p. 575]. These conclusions also follow from Pakistan's historical experience. It has been claimed that the stagnating wheat output during the Fifties and the early Seventies was respectively the result of the policy of compulsory wheat-procurement at less than world prices and a steep unilateral increase in fertilizer prices without corresponding increases in the price of wheat [3, p. 6, and 4, p. 4]. By contrast, wheat output registered unprecedented growth rates during the Sixties, largely in response to prices which were higher than those in the world market, and low prices of key agricultural inputs. In the second half of the Seventies, the reduction in the price of fertilizer and other agricultural inputs had a similar effect on growth of wheat output.

Since the prices of the major agricultural commodities, including wheat, and the key agricultural inputs have been controlled by the government in Pakistan, the policy towards agriculture is of crucial significance in determining the profitability of agriculture, wheat output and the key agricultural inputs. It is rather sad that the government, since 1979-80, has been pursuing a price policy that has resulted in a progressive decline of the profitability of wheat output in recent years in relation to key agricultural inputs and most agricultural crops. For example, against the limited increase of only 28 percent in wheat prices, the retail price of a 50-kg bag of urea was increased by 103.2 percent, from Rs. 63.00 in 1979-80 to Rs. 128.00 in 1983-84 [11, p. 34]. Depending on their brand names, price increases varied between 150 percent and 530 percent in the case of liquid insecticides and between 470 percent and 825 percent in the case of granular insecticides over the period from 1979-80 to 1983-84 [17]. There has been a near doubling of water charges over the period under consideration [27, p. 26]. The index of energy prices went up from 100.00 in 1979-80 to nearly 150 percent in 1983-84 [15, p. 157]. During the same period, the values of the implicit price deflators for agriculture, major crops and minor agricultural commodities amounted respectively to 137.7, 136.2 and 129.1 in

1983-84 [11, pp. 14-21]. Although the price increases in the case of cotton and sugarcane almost equalled those for wheat, paddy, potatoes and onion, procurement prices were increased by 58 percent, 51 percent, and 55 percent, respectively, between 1979-80 and 1983-84 [11, p. 40].

One of the consequences of the above price changes has been the stagnation or even decline in the use of key agricultural inputs since 1979-80. The total consumption of commercial fertilizers fell from 1,044,000 nutrient tons in 1979-80 to 986,000 nutrient tons in 1983-84. The annual increase in the number of the tubewells installed was only 4.5 thousand in 1983-84 as compared to 8.8 thousand in 1979-80 [11, pp. 33 and 37]. The consumption of the most commonly used insecticides in 1982 was only one-third of that attained in 1979-80 [19, p. 146]. (The data on the consumption of insecticides in 1983-84 are not yet available.)

From the foregoing, it is unmistakably clear that wheat output under the current agricultural policy is bound to stagnate or, at best, exhibit only imperceptible increases. It may also be pointed out that an indiscriminate use of this policy in the future would ultimately result in Pakistan's loss of self-sufficiency in wheat, growing dependence on wheat imports and the consequent deteriorating balance of payments. Although it may be too soon to capture the full effect of such a policy, complete stagnation in wheat output between 1980-81 and 1983-84 is a cause for alarm and may in general be attributed to the faltering agricultural policy of the recent years [11, p. 31]. It is needless to add that self-sufficiency in wheat on a sustainable basis will remain unattainable unless the present policy is seriously redirected to take opposite course in the future. While what constitutes future course of action is discussed in the next section, it is my earnest hope that the recommendations will be of some value to policy makers for ensuring self-sufficiency in wheat in the future on a sustainable basis.

IV. CONCLUSIONS AND POLICY RECOMMENDATIONS

The purpose of the present study has primarily been to review the past record of wheat output in the country and to assess Pakistan's prospects of becoming self-sufficient in wheat. As for the past record, Pakistan attained self-sufficiency in wheat in 1949-50, 1969-70 and 1979-80. Had it not been for the forced decline in per capita wheat consumption, the self-sufficiency achieved in 1979-80 would have met the same fate as that in 1949-50 or 1969-70.

The study has concluded that the desired growth rate of demand for wheat is most likely to exceed 5.0 percent per annum in the future. In view of the 3.35 percent annual long-term growth of wheat output, Pakistan has only limited possibilities of retaining self-sufficiency in wheat. Pakistan's prospects of self-sufficiency in wheat in the future are further dimmed by the dismal growth performance of wheat output (1.5 percent per annum) between 1979-80 and 1983-84.

This, however, is not to argue that wheat output is unlikely to grow faster in the future. But quite to the contrary, there seems to be a large unrealized wheat-yield potential which could be tapped for rapid increases in wheat output. There is only a limited possibility of realizing this untapped potential under the current agricultural policy as it has led to the declining profitability of wheat production and key agricultural inputs. As a consequence, the consumption of most of the key agricultural inputs has been falling in the recent years. There can be no denying the fact that rapid increases in the use of key agricultural inputs can not be increased without stepped-up profitability of wheat production through appropriate changes in government policy towards agriculture. It is in view of this consideration that this paper makes the following four recommendations.

Firstly, the current agricultural price policy which favours high prices for both input and output needs to be replaced with a policy which keeps the prices of inputs and outputs at a low level. It has been argued that when the use of modern inputs is as low as that in Pakistan, a low price policy for inputs is likely to be the most efficient way of developing agriculture [1 and 2]. The policy of low prices for inputs and outputs, unlike the current one, has no unintended adverse effects on Pakistan's competence in wheat-export market, nutrition of the poor, income distribution and inter-crop balances. In fact, the recommended policy might help the small farmers in the use of modern inputs and the poorer consumers in the improvement of their nutrition by alleviating the resource constraints.

However, it is generally argued that such a policy might involve huge subsidy bills and may not be desirable. That this is unlikely to be the case has been argued elsewhere and is discussed below [7, p. 196].

Obviously the government's claim that agricultural inputs are highly subsidized in Pakistan is based on the differences between import costs and sale prices in the case of fertilizer and between costs and receipts in the case of irrigation water. Such calculations, while logical, however, may not reflect the facts on the ground as subsidies may accrue to others rather than to the agriculturists. For example, in view of Pakistan's self-sufficiency in fertilizer, it is illogical to use import costs for calculation of fertilizer subsidy. While export price would be more relevant in this case, its plain use without adjustment for production losses at home would be equally wrong. One appropriate alternative to the above approaches is the comparison of the production costs of domestically produced fertilizers with sale prices. On the basis of this comparison, it would seem that the government provides no subsidy on fertilizer because the current retail sale price of Rs. 128.00 per 50-kg bag of urea is considerably in excess of the cost of production (Rs. 65-70 per 50-kg bag) of efficiently run domestic fertilizer plants. While farmers pay a much higher price than the cost of production of fertilizer, the difference is pocketed away either by dealers, or by factory owners or by the government. The same holds in the case of irrigation

water. The current surge in recurring expenditure on irrigation water is largely the result of revised national pay-scales, remodelling of canals and canal headworks, construction of dams, flood protection, and water-course improvement programme. While it is not clear whether agriculture should be held responsible for the increase in the recurring expenditure, which is really due to revision of pay-scales, the expenditure, associated with the rest of the measures has a long pay-off period in the future and only a small fraction of it should enter into current costs.

Secondly, the present government practice of charging farmers variously for the same amount of canal water supplied by the kind of crops grown and by cropping intensity does not make for economic efficiency of water use. Thus to think that raising of water charges would lead to greater efficiency of water use is fallacious. Like the allocation of water-supply the assessment of water charges, too, should be on the basis of the canal-commanded area. As against the disincentive effects of the current intensity related water rates, the recommended measure is likely to promote multiple-cropping both because of economy in water application and because of greater profitability of alternative sources of irrigation water.

Thirdly, in order to ensure low prices for key agricultural inputs and commodities, there seems to be a serious need for retrenchment or withdrawal of many costly public-sector programmes. For example, the cost of production of government-operated fertilizer plants is 2-3 times the cost of production in the private sector [18, p. 7]. The cost of procurement operations is quite excessive: in 1980-81, it costs the government as much as Rs. 7.79 billion. In the case of wheat alone, the procurement cost in the same year was in excess of Rs. 4.47 billion [16, p. 84]. It would be appropriate if the government-operated fertilizer plants are transferred to the private sector and the government procurement operations are restricted to only a few terminal markets. Similarly, irrigation costs could be considerably reduced through improvements in the efficiency of the irrigation department. The funds so saved may be used for improving the performance of the organizations dealing with agricultural research and extension for a proper and regular supply and enforcement of new technology.

Fourthly and finally, although the above measures promise low prices of agricultural commodities, the government should continue to guarantee minimum prices in agriculture to safeguard the interests of the farmers and consumers alike. Although the reduced prices of key agricultural inputs in relation to the current prices of agricultural commodities would ensure reasonable profit margins for agriculture, future increases in the prices of both inputs and outputs should strictly be based on cost-of-production studies. In order not to impinge on farmers profit margins, increases in input prices should not be allowed to surpass the increase in agricultural commodity prices.

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Comments on “Autarky in Food: Evidence and Prospects”

It is a pleasure to have this opportunity to comment on an important policy issue currently facing Pakistan. Dr. Ghaffar Chaudhry has clearly made a major contribution in reviewing the past experience of Pakistan in attaining self-sufficiency in wheat, outlining the challenge for the future and identifying the policy choices that must be made. With my limited experience of the wheat situation in Pakistan, I have chosen to focus my comments on Pakistan's experience from an international point of view and address three areas: (a) the need to assess Pakistan's comparative advantage in reaching self-sufficiency in different food items; (b) Pakistan's experience in attaining wheat self-sufficiency in comparison with other countries; and (c) the price-policy environment of Pakistan's wheat producers in relation to world prices.

1. COMPARATIVE ADVANTAGE AND FOOD SELF-SUFFICIENCY

First I should like to challenge the author's assertion that self-sufficiency in food is desirable as a means of increasing national income, saving foreign exchange, and increasing food security. I would have been much happier had he mentioned the important principle of comparative advantage. There are numerous examples of self-sufficiency achieved in a basic food item at substantial costs in economic efficiency and foreign exchange. And it is also easy to cite countries, especially here in Asia, that have achieved high growth rates while at the same time remaining heavily dependent on imported food.

Having said this, I should also add that I have little doubt that a sound analysis would show that most areas of Pakistan have comparative advantage in wheat production (especially in import substitution but not necessarily for exports). However, this need not imply that a strategy of self-sufficiency in other food items, such as sugar, oil seeds and dairy products, would also have positive economic benefits.

2. SELF-SUFFICIENCY IN WHEAT IN PAKISTAN FROM AN INTERNATIONAL VIEWPOINT

Now let us turn to the specific case of self-sufficiency in wheat. By comparison with other developing countries, Pakistan has been quite successful in increasing wheat production. Over the last two decades, Pakistan has been one of a selected

group of countries (with China, Turkey and Argentina) where wheat production increased faster than consumption, leading to reduced reliance on imports (see CIMMYT, *World Wheat Facts and Trends*, 1983). For the rest of the developing world, wheat imports have increased extremely rapidly at 10 percent per year and more than doubled in the short period from 1970 to 1981. In this same period, self-sufficiency in wheat for this group of countries decreased from 60 percent to 38 percent of consumption. By contrast, Pakistan was more than 85 percent self-sufficient in wheat for most of the period and has been close to self-sufficiency in recent years. Overall, wheat production in Pakistan has increased faster than the average for developing countries while the growth rate of consumption has been slightly less than the average. These figures are indeed a credit to Pakistan's wheat industry.

However, Dr. Ghaffar Chaudhry introduces a disturbing statistic that suggests that the current self-sufficiency in wheat has been achieved through a decline in per capita wheat consumption since 1977. Given the rapid growth of incomes and stable consumer prices for wheat, measured in real terms, it is difficult to accept his conclusion. Possibly statistical sources have seriously under-estimated the amount of wheat retained for home consumption or over-estimated the amount of wheat consumed by Afghan refugees.

But, more important to the deliberations of this conference is the likely trend in the future demand for wheat and its implication for self-sufficiency. The author projects an increase in desired demand for wheat of 5 percent annually. Given estimates of the income elasticity of wheat in Pakistan and neighbouring countries, I would expect a growth rate of closer to 4 percent annually. However, the rapid projected increase in the livestock sector, especially poultry, will generate substantial demand for feedgrains and given present price relationships more wheat will be diverted to livestock feeding. Moreover, if self-sufficiency is also equated with an improvement in the diets of the poor and mal-nourished then this will also add to the demand for wheat.

But whatever assumption is used, there is little doubt that wheat production will have to increase at approximately the same rate as in the recent past. This increase will have to be based mainly on increased yields since area expansion is limited by a slow-down in the expansion of irrigated area and increasing competition from higher valued crops.

3. WHEAT PRICE POLICY AND INCREASED YIELDS

Undoubtedly the most controversial issue raised in this paper is the assessment that current pricing policy is not conducive to increased yields, and hence wheat self-sufficiency, and that a re-emphasis on input subsidies, especially for fertilizer and water, is the most efficient way to provide price incentives to producers and at the same time protect the interests of consumers.

Let us first look at input-output prices in Pakistan in an international perspective. A survey of wheat and fertilizer prices across 25 countries in 1981-1982 showed that the ratio of 2.5 between nitrogen and wheat prices in Pakistan was quite favourable in relation to other major wheat producers. Since then, of course, the price of nitrogenous fertilizer in Pakistan has risen significantly while there has been only a small change in wheat prices. The current nitrogen/grain price ratio stands at 3.5 and is somewhat higher than the rates of 2.5 to 3.0 which prevails in most large wheat-producing countries. The differences arise, however, from a lower price of wheat in Pakistan rather than a high price for nitrogen. It should also be noted that the consumer price for wheat products in Pakistan is also somewhat lower than average, suggesting a policy of maintaining low producer prices in order to reduce consumer prices. At present both wheat and nitrogen prices to Pakistan's farmers approximately reflect world prices, assuming that Pakistan is an exporter of both commodities.

Given this background, I have to disagree with the author on his recommendations for implementing a fertilizer subsidy. In the first place, he presents little evidence that this would have a significant effect on wheat yields without changes in other management practices employed by farmers. Moreover, a fertilizer subsidy is not restricted to wheat but has implications for the whole agricultural economy. It would encourage more fertilizer use on a crop such as sugarcane where incentives are already high because of a producer price set above world prices.

I share Dr. Ghaffar's concern regarding the effects of increased wheat prices on the poor. However, it must be remembered that the current policy provides cheap wheat to urban consumers of all income groups, at the expense of the rural sector where most of the poor live and work. If the concern is with maintaining low prices to poor urban consumers then there are methods of targeting consumer subsidies on this group without taxing the rural sector.

It is, of course, true that average fertilizer application rates and yields of wheat in Pakistan are lower than in most other countries such as China, Mexico and Egypt, where wheat is largely grown under irrigated conditions. However, improved price incentives are not the only way to rectify this difference and certainly not the most efficient. An alternative method of increasing fertilizer use on wheat in Pakistan would be to increase the response to fertilizer through improved management practices such as improved plant stands and better weed control. This requires more efforts in applied research and extension.

CIMMYT Regional Economist,
South Asia,
Islamabad

Derek Byerlee