



HOW MUCH WHEAT WILL PAKISTAN NEED TO IMPORT DURING 1989-90?

A Special EAN Policy Briefing Paper

by

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1 INTRODUCTION

The experience of the past five years has shown that Pakistan's wheat production is not keeping pace with consumption. In view of the 14.4 million ton production estimated for the 1989 harvest season by the *Pakistan Economic Survey, 1989-90*, it is useful to review some of the implications of this year's crop on import needs.

2 THE 1988-89 WHEAT MARKET

Last year's poor crop resulted in a major increase in imports. A quick review of the factors contributing to that large import demand will help put the current season in better perspective.

2.1 DEMAND

A retail wheat demand function was estimated by assuming: a price elasticity of demand of -0.24; a retail price of Rs 2.6 per kg.; and total market demand of 13.80 million tons. The price elasticity is based on estimates from the London School of Economics and Political Science¹. Market demand was estimated by expanding the annual per capita wheat consumption estimated in the Federal Bureau of Statistics *Household Income and Expenditure Survey, 1984-85* to a population basis, assuming an annual population growth rate of 3.1 percent. The function is defined as:

$$Q_D = a + bP \quad [1]$$

or

$$Q_D = 17.1059 - 1.2734P \quad [2]$$

The conventional price-dependent function based on equation [1] is:

$$P = -\frac{a}{b} + \frac{1}{b}Q_D \quad [3]$$

or

$$P = 13.4333 - 0.7853Q_D \quad [4]$$

2.2 SUPPLY

A wholesale supply function was first estimated by assuming: a supply elasticity of 0.2; a wholesale price of Rs 2.25 per kg.; and farm production of 12.6 million tons. Most wheat supply elasticity estimates are in the 0.15 to 0.25 range. Mubarik Ali recently estimated an elasticity of 0.23 for the short run². The resulting equation was

1 Ahmad, Ehtisham, Stephen Ludlow and Nicholas Stern. "Demand Response in Pakistan: A Modification of the Linear Expenditure System for 1976". Discussion Paper No. 6, London School of Economics and Political Science, 1987.

2 Ali, Mubarik. *Supply Response of Major Crops in Pakistan: A Simultaneous Equation Approach*. Special Report No. 11, Economic Analysis Network Project, Directorate of Agricultural Policy, Ministry of Food, Agriculture and Cooperatives, Government of Pakistan, Islamabad, December 1988.

adjusted to the retail level by adding Rs 0.35, the wholesale-retail margin, and reducing supply by 10 percent to account for post-harvest loss. The retail function is defined as:

$$Q_s = c + dP \quad [5]$$

or

$$Q_s = 8.4276 + 1.1199P \quad [6]$$

The conventional price-dependent function based on equation [5] is:

$$P = -\frac{c}{d} + \frac{1}{d}Q_s \quad [7]$$

or

$$P = -7.5250 + 0.8929Q_s \quad [8]$$

2.3 MARKET EFFECTS OF SUPPLY AND DEMAND

The implications of equations [4] and [8] are shown in Figure 1. If retail prices were held in the vicinity of Rs 2.6, about 11.34 million tons was supplied, while about 13.8 million tons was demanded, resulting in a shortage of about 2.46 million tons. The shortage could have been even higher due to smuggling into Iran and Afganistan, and diversion to livestock feed. To cope with the shortage, the government imported about 1.9 million tons and drew upon existing carry-over stocks. The model depicted in Figure 1 implies that, in the absence of existing subsidies aimed at holding prices down, the market price would have moved toward Rs 3.6 and supply and demand would have matched at about 12.5 million tons.

3 THE 1989-90 WHEAT MARKET

Last year's large wheat shortage has prompted renewed concern about continuing shortages if the 15 million ton production target is not met. An analysis of the current year's market suggests continued, major shortages, although smaller than 1988-89.

3.1 DEMAND

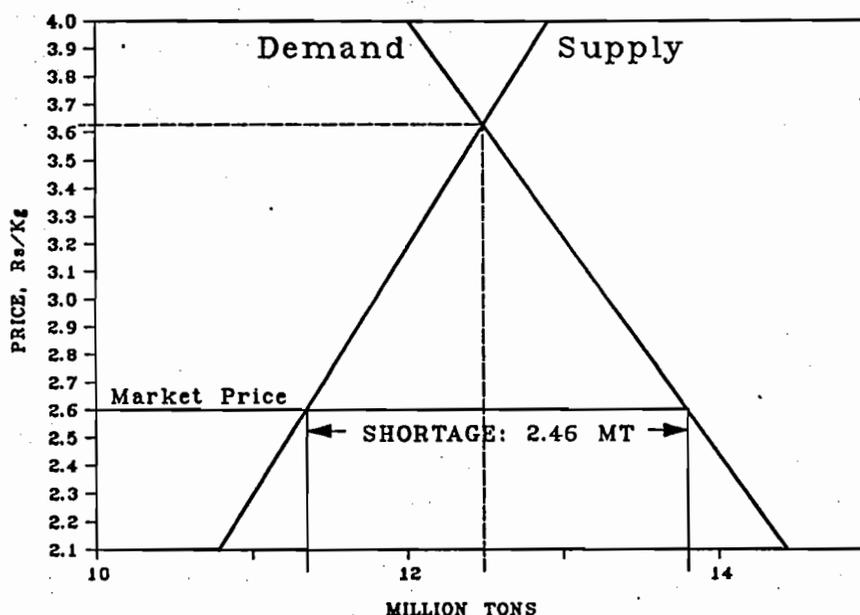
A retail wheat demand function for 1989-90 was estimated by assuming: a price elasticity of demand of -0.24; a retail price of Rs 2.7 per kg.; and a total market demand of 14.22 million tons. The resulting price-dependent equation, like Equation [4], is:

$$P = 13.95 - 0.7911Q_D \quad [9]$$

3.2 SUPPLY

A wholesale wheat supply function for 1989-90 was first estimated by assuming: a price elasticity of supply of 0.2; a wholesale price of Rs 2.38 per kg.; and a farm

FIGURE 1. PAKISTAN RETAIL WHEAT MARKET, 1988-89



production level of 14.4 million tons. Over the past decade, the combined annual highest acreages and yields would produce 14.5 million tons. It is therefore very unlikely that the current crop will exceed 14.5 million tons. The resulting equation was adjusted to the retail level by adding Rs 0.325, the wholesale-retail margin, and reducing supply by 10 percent to account for post-harvest loss. The resulting retail price-dependent equation, like Equation [8], is:

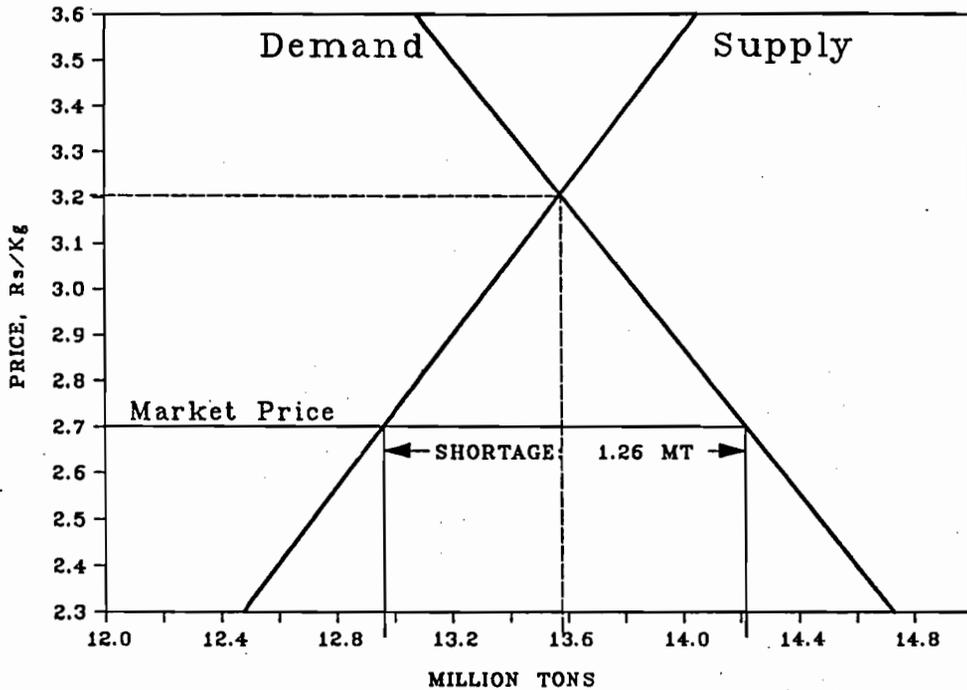
$$P = -9.50 + 0.8247Q_s \quad [10]$$

3.3 MARKET EFFECT OF SUPPLY AND DEMAND

The implications of Equations [9] and [10] are shown in Figure 2. If retail prices are held in the vicinity of Rs 2.7, about 12.96 million tons will be supplied, while about 14.22 million tons will be demanded, resulting in a shortage of about 1.26 million tons. This estimate does not account for unknown amounts smuggled into Iran and Afghanistan and diverted to livestock feed. To satisfy consumer needs, imports will be needed to supplement the meager carry-over stocks remaining from the last season. The model depicted in Figure 2 implies that, in the absence of existing subsidies, the market price would move toward Rs 3.2 and supply and demand would move toward equilibrium at about 13.58 million tons.

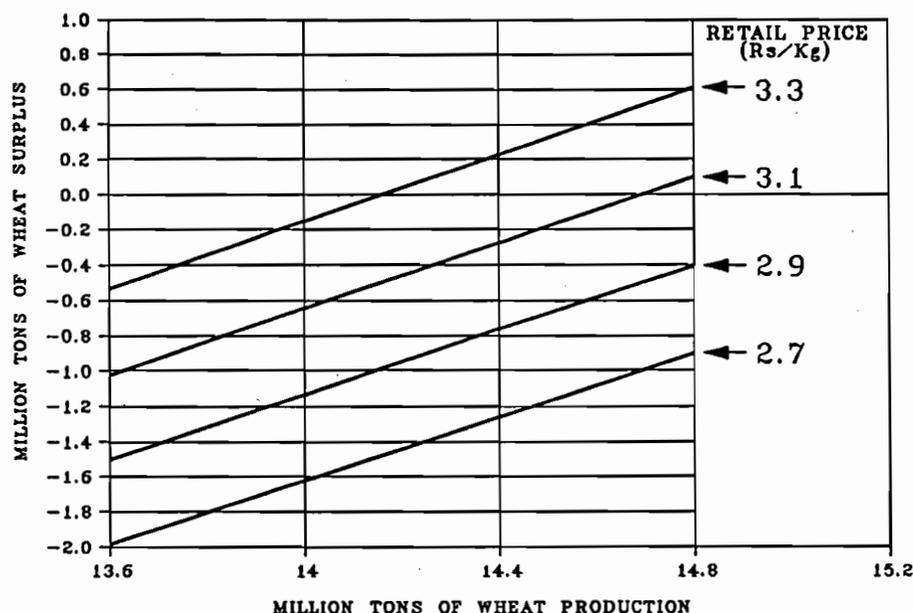
The supply equations presented in Figures 1 and 2 were estimated under the assumption that wheat supply response in the present period is largely determined by farmgate-wholesale price in the last period. It should be emphasized that a sudden abandonment of the existing price-depressing subsidies would not result in an increased quantity supplied because the current crop season is fixed.

FIGURE 2. PAKISTAN RETAIL WHEAT MARKET, 1989-90



A more useful way of evaluating the 1989-90 market is to assume that prices were free to respond to market forces over an intermediate period of 1-3 years. In this case, the model presented in Figure 2 can be revised to show the interactions of market price and production on surplus, the difference between consumption and production. Figure 3 shows that under the present realistic range of production possibilities, if the retail price is held below Rs 3, a shortage is inevitable.

FIGURE 3. ALTERNATIVE ESTIMATES OF 1989-90 WHEAT SURPLUS



4 POLICY IMPLICATIONS

The supply and demand parameters used to develop the models in Figures 1 and 2 follow conventional research findings that the short-run supply of most crops is usually inelastic with respect to price. While the slope of the supply curve is relatively steep (price inelastic), the more serious problem is the wide shifts in supply due to weather. Conversely, consumer demand has shown steady growth, following the population growth rate of 3.1 percent per annum, and encouraged by policies to dampen retail prices.

4.1 PERSISTENT SHORTAGES

The opposing forces of supply and demand under existing policies have led to persistent wheat shortages. The long-held goal of self-sufficiency in wheat production may be attainable, but the current economic environment suggests the forces of comparative advantage should be studied more carefully to find alternative crops to pay for the annual wheat deficit.

4.2 IMPORT MANAGEMENT

If imports are required on a regular basis, it would be useful to study the wheat import organization to determine where costs can be reduced.

4.2.1 TIMELY PURCHASES AND SHIPMENT

If one-half to 1.5 million tons of wheat are expected to be imported annually, significant cost savings can be realized by promptly entering the international market

as soon as domestic needs are verified. The current crop reporting system can be modified to give more timely production estimates. Purchases from exporters can be scheduled to avoid some of the high costs associated with waiting until the market has adjusted to major crop losses, and to benefit from falling prices when major wheat exporters have large crops. Scheduling shipment is also important to avoid interference of imports with preparations for storing the next crop.

4.2.2 COORDINATION BETWEEN IMPORTERS AND FLOUR MILLERS

The heavy level of wheat imports also places an additional burden on the flour milling industry. Imported wheat often does not meet the local milling quality standards. More coordination between wheat importers and flour millers could result in purchasing wheat more suitable for local milling needs.

4.3 PRICING

The current practice of subsidizing most government-procured wheat as it is sold to millers encourages more consumption while denying the farmer similar benefits and aggravating the wheat import problem. It is important to avoid setting domestic prices so low, in response to genuine concerns for consumer welfare, that major opportunities are lost to farmers whose resources are not allowed to compete for greater returns relative to world prices. During 1987-88, imported wheat cost about Rs 3,000 per ton, but the wholesale price for 1988-89 was only about Rs 2,250. The 1988-89 import price probably exceeded \$150 per ton and the continuing drought in the United States will probably result in world prices above \$150 per ton for 1989-90.