Wheat Production in Pakistan: Saga of Policy Disincentives

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Abstract

This study probes into the interplay of the factors operating on supply side of the wheat economy of Pakistan. The analysis is carried out to determine the performance of the agricultural policy of the country in securing a sustainable measure of self-sufficiency in food production. It is argued that, compared to the developed countries, the developing countries like Pakistan have done too little and too late for their farm sector. The authors hold that the agricultural performance of the developing countries is directly affected by the high subsidies paid to the rich country farmers by their governments. The study attempts to determine the relationship of both wheat production and wheat productivity with the prices promised to the growers in Pakistan by government's agricultural policy over the period 1966-2001. The results show that support price policy, adequate water availability and technology together helped enhance the wheat production of the country. The estimated coefficient showing the relationship between support price and wheat productivity, however, turns out to be insignificant. The analysis also incorporates the shocks in the economy that are independent of the usually normally-distributed random error. The results show that shocks are affecting both wheat production and wheat productivity. It is argued that achievement of the proclaimed objectives of the wheat support price policy in Pakistan has been constrained because of the incumbent governments' high political stakes, usually warranting protection of urban consumers and producers by keeping food prices low. The study concludes that wheat production is not some peripheral issue and the target of increasing both wheat production and wheat growers' income must be central to the macro management policy in Pakistan. Finally, the authors maintain that developing countries, while trusting the promise of freer trade in farm goods offered by the Doha Round, must remember the raw deal they got from the Uruguay Round.

Introduction

Food is the basic and most important concern of the *living organisms*. Viewed in this light, world governments' policies designed to support cereal production, the main food item consumed by the *homosapiens*, are both warranted and justified. However, in developing countries like Pakistan, such policies have been frequently in conflict with their governments' concern to ensure the availability of food at low prices, particularly

for urban consumers.This paper is an attempt to analyze the impact of agricultural pricing policy of the government in Pakistan on the production of wheat, the most strategic commodity of the country. The analysis is carried out in three parts. Part I highlights the important aspects of the world economy of cereals and provides a backdrop for the subsequent analysis. The quantitative analysis, carried out in Part II, provides the estimates on both supply and yield response of wheat. Before presenting the conclusion and recommendations, the statistical findings are further substantiated by the qualitative analysis in Part III which identifies the gaps and weaknesses of the wheat policy in Pakistan.

I.

Wheat is the most widely used staple food grain of the world. The world wheat output declined from 591.9 to 589.1 million tons in two years to 2002. The forecast for 2004 is further on the low side, 556.4 million tons. Wheat is also a very important internationally traded commodity. A little over one fifth of the world wheat production is traded worldwide. The annual average volume of world wheat trade has been about 106 million tones during 1999 to 2003.[1] By 2020, world demand for wheat is expected to be 40 percent higher than that of its level in the later half of the 1990s [Rosegrant 1997]. But the resources available for wheat production are likely to be significantly lower. The challenge for increasing wheat supplies is much greater in the developing countries than it is in the developed world. Table 1 illustrates the widening gap in cereal production between the developed and developing countries and continually increasing food dependence of the latter. The marked and constantly increasing difference between the performance of two country groups, observed in Table 1, largely owes to the institutional factors. Most of the developing countries still have agrarian economic structures. But industrially developed countries as a group have attained, through their

[1] See, 'Basic Facts of the World Cereal Situation', *Food Outlook*, No. 4, Rome, September 2003, Food and Agriculture Organization (FAO) of the United Nations.

Table: 1 **World Cereal Production and Cereal Exports**

Category/Year	Country Group	
	Developed	Developing
Production (kg per capita)		
1967	546.6	176.00
1982	670.4	206.8
190	680.3	216.0
1997	660.1	225.6
Exports (million tonnes)		
1967	24.6	-21.7
1982	73.8	-68.7
190	93.2	-87.6
1997	105.9	-98.8

Source: The figures are taken from worldbank.org site, quoting from the Food and Agriculture Organization (FAO) Statistics.

farm support policies, an artificial advantage over the developing countries, particularly in cereal production. [2] Presently, their farm subsidies amount to over US$300 billion a year [OECD 2002] which encourage overproduction and distort trade by artificially depressing prices in the international market. Rich countries' farm subsidies are also responsible for dumping cheap food in poor countries' markets. The Uruguay Round of trade talks had only a token effect on the level of farm subsidies in the developed countries, because cuts in subsidies were measured from 1986, when subsidies were at their peak. In developed countries, subsidies have added to the farmers' power so much that their farmers not only delayed the Uruguay Round over a trifling amount of grain and oil seeds, they have also held the world economy to ransom in the ongoing Doha Round of trade talks.

The irony is that while paying subsidies to their farmers, rich countries have put pressure on developing countries to reduce or eliminate the farm subsidies. It is a case of protection for the rich and free play of market forces for the poor. Resultantly, many of the previously self-sufficient countries have now become net food importers. This needs

[2] Indeed, the history of agricultural subsidies in developed countries can be traced back to the 17th century when the British Corn Laws were made to protect British farmers from import of foreign grains

is to be compared with the history of the European Union (EU) whose members' import of cereal was 24.2 million tonnes in 1967,[3] but by 1990 they were dumping the world market by exporting 29 million tonnes of highly subsidized surplus cereal production.[4] The developed countries consumers' welfare has always been sacrificed to that of their farm producers. But in most of the developing countries, the political factors have very frequently motivated the governments to overlook the interest of the rural producers, particularly of the small farmers, and ensure the welfare of comparatively better informed and organized force of urban consumers and producers. Given the constantly widening developmental gap between North and the South and the economic and social imperatives in many of the developing countries, the uplift of the rural sector of the latter is fundamental to any macro development policy, particularly in a world where the livelihood of the poor farmers is undermined by the world markets corrupted by the farm support programs of the developed countries.

Like many other developing countries, agriculture is the most important sector of Pakistan's economy and wheat is the country's most important agricultural commodity. It is grown by 80 percent of the farmers, more than four million, on close to 40 percent of the cropped area, contributing roughly a quarter of the total crop sector value added [Coleman and Faruquee 1996].[5] Being staple food grain of Pakistan, wheat supplies 72 percent of the calories and protein in the average diet. According to the Pakistan Agricultural Research Council (PARC), per capita wheat consumption of the country, at 120 kg a year, is among the highest in the world [PARC 1989]. Wheat is also the most important single product as a source of income in the rural areas of Pakistan. In 1975-76, wheat production alone contributed 19.5% of the household income generated in the entire agricultural sector of the country [Cornelisse and Opdam 1982].

Before independence of the subcontinent from the colonial rule, Punjab was considered granary of the United India. In the first decade of her independence, through most of the 1950s, agricultural surpluses were taken for granted in Pakistan, and the government

[3] The EU at that time was a custom union arrangement, called the European Common Market. It consisted of only six member countries, France, Germany, Italy and the three Benelux countries.

[4] The figures are taken from worldbank.org site, quoting from the Food and Agriculture Organization (FAO) Statistics.

policy demonstratively discriminated the agricultural sector in favor of the manufacturing industry. This neglect, along with the degradation of land fertility and perpetual underdevelopment of the rural sector, soon started to take its toll and the surplus existing at the time of inception of the country was rapidly dissipated by the high population growth unaccompanied by a corresponding increase in production.[6] These factors together made Pakistan to have resort to wheat import for avoiding food shortages. Despite having comparative advantage in wheat production, Pakistan, for most part of its history has been a net importer of wheat.

After the neglect of the 1950s, agricultural policy in Pakistan offered a few incentives to the farmers. Further, in the early 1960s, the development and release of the modern wheat varieties triggered the Green Revolution (GR) throughout the world.[7] Beginning in the mid 1960s, GR technologies were introduced in Pakistan, including high yielding varieties of rice and wheat, the two major food crops of the country, and investment in agriculture and market infrastructure. As a result, the country experienced encouraging increase in agricultural production. However, the increasingly intensified input use was later matched by lower marginal returns[Byerlee, 1992] and the continued intensification of cropping has caused degradation of resource base in the form of salinization, overexploitation of ground water, physical and chemical deterioration of the soil, and pest and disease problems[Fujisaka *et. al.* 1994; Siddiq 1994]. Our analysis below will show that the GR bonanza was a short-lived phenomenon in Pakistan. It neither made the country self-sufficient in food production nor increased the welfare level of its poor farmers. The analysis will also show that, in the case of wheat production targets, the

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[5] A very large majority of the wheat growers are either small holders or tenant farmers. About 96% of the landholdings are less than 10 hectares and about 93% of all farm production is on holdings ranging from 2-4 hectares.

[6] The major part of the population growth in the early years owes to the migratory pressure of the people moving from India to Pakistan.

[7] The first and most important factor contributing to the success of GR was wheat itself: semi-dwarf, high yielding and rust-resistant wheat seed. Wheat revolution originated in Mexico in 1943. The largest gains in productivity were made in land scarce countries where the new seed and fertilizer technologies fostered rapid growth in agricultural productivity. By the late 1970s, 40% of the wheat area in developing countries was sown to modern high-yielding varieties; the figure for Asia was close to 70%. See, Byerlee and Moya, 1993. By 1994, 78% of the wheat area in developing countries was under modern varieties. The corresponding figures for Asia and Latin America were 91 percent and 92 percent respectively. See, Morris, 1994.

establishmentarian factors must own a large share of blame for the shortcomings and failures.

II.

To study the impact of Pakistan's support price policy on wheat production in the country, we apply the Frontier Production Program(FPP), version 4.1c, written by Tim Coelli of the University of New England, Australia. When modeling a production function, the FPP represents the largest possible output that can be produced with a given amount of inputs. Another purpose for applying FPP is to incorporate the shocks that are independent of the usual normally- distributed random errors.[8]

Two single-equation models are formulated, specifying separately the supply and yield response of wheat.

The supply response of wheat is measured with the help of the following multivariate functional form:

$$\text{Ln } WP_t = \alpha_0 + \alpha_1 \text{LnWSP}_t/FP_t + \alpha_2 \text{LnW}_t + \alpha_3 T_1 + \alpha_4 T_2 + \alpha_5 T_3 + \alpha_6 D_1 + e_t + \mu_t$$

Where,

Ln= natural logarithm (i.e., logarithm to base e)

WP_t= total output of wheat in thousand tonnes in year t

WSP_t= wheat support price per 40 kilograms in year t

FP_t= fertilizer price per 40 kilograms in year t

W_t= total water availability in rabi season in million acreage feet in year t

T_1= first phase, the G R period, 1966-74 [9]

T_2= second phase, the input intensification period, 1974-84[10]

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[8] A significant contribution of FPP is that it also allows to carry out the Likelihood Ratio (LR) test. The latter is applied in the following form:

LR = -2[L (H0) – L (H1)]

Where, L (H0) and L (H1) represent the values of the log likelihood functions under the null and alternate hypotheses respectively. The LR test statistic has an asymptotic chi-square distribution with degrees of freedom equal to the difference between the number of parameters in the unrestricted and restricted form models.

[9] During this period, the technological breakthrough in the form of new, high-yielding modern varieties (MVs), responsive to inputs, provided the potential to dramatically increase the land productivity. See, Byerlee, 1992.

[10] This phase began after the widespread adoption of MVs. In this phase, the intensification of input use, especially chemicals, substituted the increasingly scarce land for agriculture. See, Byerlee, 1992.

T_3= third phase, post-GR period, 1984-2001[11]

D= dummy variable for drought, 1= drought year 0= normal year

e_t= usual normal random error which are normally distributed having zero mean and constant variance σ_e^2

μ_t= not usual random error, as it is independent of the usual normally distributed random error having variance σ_u^2.

For measuring the yield response of wheat, following function is formulated:

$$\text{Ln } WP_t/WA_t = \beta_0 + \beta_1 \text{LnWSP}_t/FP_t + \beta_2 \text{LnW}_t/WA_t + \beta_3 T_1 + \beta_4 T_2 + \beta_5 T_3 + \beta_6 D_1 + \nu_t + \mu_t$$

Where the additional notations denote,

$WA_{t=}$ wheat area in thousand hectares in year t

$\nu_{t=}$ usual normal random error, which are normally distributed having zero mean and constant variance σ_v^2

Our approach is to estimate growth in farmers' partial productivity, including three phases corresponding to the different levels of technical change brought about by the GR. We use national level data for Pakistan, on all inputs, output and prices taken from secondary sources, over the period 1966-2001. Table 2 lists the estimated coefficients of the supply response function, obtained both by the Ordinary Least Square (OLS) and Maximum Likelihood Estimate (MLE) methods. The coefficients of all parameters are statistically significant for both methods. However, the MLE coefficients appear to be better than OLS estimates, as the former are highly significant at 1 percent level, except the dummy variable which is significant at 5 percent level. Also, the values of the coefficients of real price effect of fertilizer, WSP/FP, used to adjust for inflation, and water availability are higher in MLE than that of the respective OLS estimates.

The MLE results show that 1 percent increase in real price, WSP/FP, increases the wheat production by about one third, 0.3388 percent, and it is highly significant. [12] The results support the findings by Ikram (2000) who also shows that wheat growers in

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[11] The third phase begins after input use had reached high levels. In this period, farmers' experience with the new technology, together with changes in support institutions and policies, have evolved to allow improved managerial and information skills to substitute for input use and to increase input efficiency. See, Byerlee, 1992.

Table: 2 **Supply Response of Wheat: Estimated Coefficients**

Dependent variable = Wheat Production, N0. of observations = 35, Degree of freedom = 29

Variables	Coefficients■	
	OLS	MLE
Constant	13.69998***	13.5892***
	(21.2147)	(22.5545)
Ln(WSP/FP)	0.1758*	0.3388***
	(1.7448)	(6.9823)
LN(W)	0.5825***	0.6838***
	(2.8794)	(3.9146)
T_1	0.0438***	0.03531***
	(3.8552)	(3.9882)
T_2	0.0332***	0.0281***
	(4.4339)	(5.0758)
T_3	0.02675***	0.0239***
	(4.5650)	(4.8817)
D	-0.0856***	-0.0609**
	(-2.4701)	(-2.2054)

*Significant at 10 percent level
**Significant at 5 percent level
***Significant at 1 percent level
■Figures in parentheses are t-ratios.

Pakistan respond positively to the price incentives. The estimated coefficient of water is also highly significant and shows that 1 percent increase in water availability increases the wheat production by 0.6838 percent. Table 2, also describes the growth trend of wheat during the GR, intensification and post-GR period. The estimated production trend, T_1, shows that during the GR period the wheat production increased by 3.59 percent annually.[13] It is a valid result as the estimated coefficient is significant at 1 percent level. In the second phase, the input intensification period, the growth rate, coefficient of T_2, however, declines to 2.85 percent annually, creating concerns that gains accruing from the GR may not be long term promise. The trend continues in the third phase, the post-GR phase, as the coefficient of T_3 generates 2.42 percent growth rate per annum and this result is also significant at 1 percent level. Finally, the dummy

[12] The FP denomination is the support price of Dianomium Phosphate.
[13] The growth rate is calculated by using the standard formula: $e^{0.03531} - 1$ (100).

variable D, representing the drought effect, also carries a significant coefficient with a right sign, showing that in drought years the wheat production decreased by 0.06 percent.

The observed decline in the growth rate may be blamed on the decline in soil organic matter resulting from the intensive input use. Farmers tend to apply less organic manure when the tractors are substituted for bullock power. Experimental findings by the Indian Agricultural Research Institute (IARI) show that decline in the use of organic manures, along with the general pattern of removing all crop residues, reduces soil organic matter content [See, IARI, 1989]. However, various other factors were also responsible for gradual increase in soil related problems. For example, the use of poor quality ground water has exacerbated sodicity problem both in Pakistan and India [Byerlee and Siddiq, 1990]. The FPP also provides technical efficiency estimates of the model, listed in Table 3. This exercise helps incorporate the shocks, as the estimates generate the yearly change taking place in the efficiency of wheat production. The average technical efficiency is found to be 0.92 with a minimum of 0.76, while the maximum value is 0.99. The results show an unstable pattern because of the presence of shocks that are independent of the usual normally-distributed random error. These shocks include political instability, weather conditions, virus attacks and agricultural policies of the government.

To assesses the contribution of shocks in wheat production, the Likelihood Ratio (LR) test is used and the results are reported in Table 4. The LR test provides valid findings, as the estimated coefficient is statistically significant at 1 percent level with a t-statistics greater than critical value, showing that shocks have been affecting wheat production in Pakistan.

Table 5 lists the findings obtained by estimating the function formulated for measuring the yield response of wheat. These results are also generated by applying both the OLS and MLE methods. The six parameters are estimated for assessing farmers' productivity by applying both methods. Real price and water availability are both insignificant. However, the results of the MLE technique are corresponding with the OLS Estimates. In MLE, $\beta_{1,}$ though statistically insignificant, generates a small but positive coefficient of real price, 0.13, for the wheat productivity. The relationship between

Table: 3 **Technical Efficiency in Wheat Production**

Year	Efficiency	Year	Efficiency
1966-67	0.76	1984-85	0.89
1967-68	0.94	1985-86	0.99
1968-69	0.93	1986-87	0.82
1969-70	0.98	1987-88	0.85
1970-71	0.92	1988-89	0.97
1971-72	0.89	1989-90	0.94
1972-73	0.92	1990-91	0.91
1973-74	0.98	1991-92	0.94
1974-75	0.98	1992-93	0.97
1975-76	0.91	1993-94	0.82
1976-77	0.88	1994-95	0.93
1977-78	0.81	1995-96	0.94
1978-79	0.82	1996-97	0.84
1979-80	0.97	1997-98	0.99
1980-81	0.93	1998-99	0.97
1981-82	0.99	1999-2000	0.97
1982-83	0.97	2000-01	0.85
1983-84	0.86		

Table: 4 **Likelihood Ratio Test of Wheat Production**

Hypothesis	Log likelihood function	t-statistics	Critical value
L(H1)	50.5891		
		7.23***	6.63
L(H0)	46.976		

*** Significant at 1 percent level.

water availability and wheat productivity is also insignificant. The results suggest that the support price and water availability have not played any role in effecting the wheat productivity. The insignificant, though positive, estimate of the area impact on yield, recorded in Table 5, endorses the work already carried out by Coleman and Faruqee (1996) who also showed negligible productivity impact as the growers bring more area under wheat cultivation with increase in support price. But statistically significant results obtained by Ikram (2000) show that support prices are positively related with the

Table: 5 **Yield Response of Wheat: Estimated Coefficients**

Dependent variable = Wheat Productivity, N0. of observations = 35, Degree of freedom = 28

Variables	Coefficients■	
	OLS	MLE
Constant	2.2773	2.5407
	(0.9272)	(1.2240)
Ln(WSP/FP)	0.1349	0.1300
	(1.5640)	(1.5078)
Ln(W/WA)	0.1846	1.9826
	(0.9301)	(1.1915)
T_1	0.0414***	0.0326***
	(4.5111)	(3.8231)
T_2	0.0340***	0.0303***
	(6.9526)	(6.8536)
T_3	0.02667***	0.0241***
	(7.9654)	(8.8329)
D	-0.0851***	-0.0746***
	(-2.8998)	(-3.0960)

*** Significant at 1 percent level.

■Figures in parentheses are t-ratios.

yield.[14] The variables T_1, T_2, T_3, and D are significant at 1 percent level. The annual growth in wheat productivity is 3.36 percent, 3.05 percent and 2.44 in the GR, input intensification and post-GR period respectively. The estimated coefficient on the dummy variable, D, is -0.07, fairly close to -0.06 value generated for the wheat production response model.

In Pakistan, overall, the extension services, private sector information transfer and rural schooling have failed to keep pace with farmers' needs. The observed pattern of wheat productivity growth rate endorses the suggestions of many previous studies that have related productivity growth in the agricultural sector to the technical change, extension system, infrastructure investment, human capital endowments and policy reforms [Rosegrant and Evenson 1992; Kumar and Mruthyunjaya 1992; Fan *et al.* 2000, Pingali and Heisey 2001].

The technical efficiency is also determined for yield response of wheat and the results, showing the effect of shocks on the yearly efficiency of wheat productivity, are listed in

Table: 6 **Technical Efficiency in Wheat Productivity**

Year	Efficiency	Year	Efficiency
1966-67	0.79	1984-85	0.94
1967-68	0.97	1985-86	0.99
1968-69	0.95	1986-87	0.87
1969-70	0.98	1987-88	0.93
1970-71	0.92	1988-89	0.98
1971-72	0.95	1989-90	0.95
1972-73	0.97	1990-91	0.94
1973-74	0.97	1991-92	0.97
1974-75	0.97	1992-93	0.98
1975-76	0.98	1993-94	0.92
1976-77	0.96	1994-95	0.95
1977-78	0.92	1995-96	0.92
1978-79	0.92	1996-97	0.89
1979-80	0.97	1997-98	0.96
1980-81	0.97	1998-99	0.97
1981-82	0.98	1999-2000	0.97
1982-83	0.96	2000-01	0.9
1983-84	0.89		

Table: 7 **Likelihood Ratio Test of Wheat Productivity**

Hypothesis	Log likelihood function	t-statistics	Critical value
L(H1)	54.4786		
		3.4276*	0.157908
L(H0)	52.7648		

*Significant at 10 percent.

Table 6. The average technical efficiency is found to be 0.94 in the yield response model, two points higher than that of estimated supply response model. The respective minimum of the former, 0.79, is also higher by three points than that of the latter. However, the maximum is the same, 0.99. Overall, the results do not show wide variations between the two models.

The result of LR test, reported in Table 7, is statistically significant at 10 percent level, t-statistics is greater than critical value, showing that the shocks are affecting wheat productivity in Pakistan.

[14] The difference in results may be due to the research technique and variables selected. Ikram (2000) has applied Nerlovian Adjustment Model for estimating the elasticity of supply for linear and log-linear model.

Our results on productivity growth in many ways support the empirical evidence from parts of Asia that experienced GR induced changes. Ali and Byerlee (1991), for example, suggest that when new technologies were first adopted, inefficiency was fairly high. In general, high levels of technical inefficiency were due mainly to deficiency in information and technical skills. All these were probably serious factors in Pakistan, where poorly educated farmers switched in a single generation from traditional agriculture to complex multiple cropping systems dependent on significant levels of modern inputs. Finally, crop yields are only a measure of partial factor productivity, whereas the overall performance of the agricultural sector is generally measured by total factor productivity (TFP). The TFP approach compares an index of output changes with an index of input changes. For Pakistan, two studies indicate negative TFP growth in the post-GR period [Azam *et. al.* 1991; Ali and Velasco 1994]. However, the results obtained by Khan (1994) show that TFP in Pakistan's agriculture grew sharply in the period 1980-92, at an annual rate of 2.1 percent. These conflicting results may in part be due to the studies' widely varying coverage of inputs and outputs, methods of valuing inputs, index procedures to estimate TFP, and level of disaggregation.

III.

The statistical findings in the foregoing show that support price policy in Pakistan has positively affected the wheat production levels. However, no effect is observed on the farmers' yield. The increase in wheat production helps keep the food prices low in the short-run, but the national cause of achieving food self-sufficiency is threatened as the sustainability cannot be ensured without increasing the farm incomes which largely depend on the productivity gains. It is the growers' productivity that helps the growth in farm incomes to keep pace with the growth of incomes in the rest of the economy. The analysis in the following attempts to identify the loopholes and gaps in the wheat support price policy of Pakistan, which may in part be responsible for not allowing the farmers to compete with their counterparts in the developed world.

The wheat market in Pakistan has mostly been subject to widely varying forms of government interventions, ranging from monopoly purchases in early years to support price since 1981. Most of the interventions, however, appear to have been designed for

transferring resources both from growers and from the government to the consumers, inflicting an overall welfare/efficiency loss to the economy. The farm policy in Pakistan is so inconsistent and incoherent that it becomes very difficult to work out who pays how much to whom. Nonetheless, the results of a recent study show that, between 1973-1996, wheat market interventions caused an average annual loss of 24 to 25 billion rupees to the producers and a cost of rupees 6 billion to the government, while consumers gained 17 billion rupees annually. Welfare loss ranged from rupees 13 to 14 billion per annum which was 3 to 4 percent of the real GDP from the agricultural sector [Ashfaq *et al.* 2001]. There is no doubt that input subsidies, before they began to be reduced in the late 1980s, have been an important element of public spending in Pakistan. At the core of the input price policies was a strategy of massive subsidization of fertilizer, credit, power and irrigation inputs. But the inputs subsidies had a strong bias towards large farmers [Sims 1986, 1993]. Input subsidies were maintained well beyond an initial period when they might have been economically justified to overcome farmers' risk aversion and to support learning by doing. Given the opportunity cost of the scarce public funds in Pakistan, it was not possible for the government to implement an effective support price mechanism, as the input subsidies, once established, were difficult to remove because of the strong lobbying of the large farmers in the political establishment of the country. Indeed, an egalitarian and productive alternative to massive input subsidization was indiscriminate investment in the entire rural uplift. Empirical evidence suggests that, in the Asian context, investment in rural infrastructure, human capital and research and extension play a dominant role in influencing supply and productivity growth[Binswanger *et al.* 1993; Fan *et al.* 2000; Rao 1989]. Findings of various studies suggest that share of public expenditures allocated to agriculture has been much lower than what the sector requires [see, for example, Choudhry and Faruqee 1995]. It was also lower in comparison with the neighboring country, India. By the mid 1980s, all the rural villages in Indian Punjab were electrified, the density of road work was well above the West Punjab in Pakistan, and more than 90% of the cropped area was irrigated [Fan *et al.* 2000]. In Pakistan, by comparison, investment in education and rural infrastructure was much lower [Mujahid-Mukhtar 1991; Rosegrant and Evenson 1992; Faruqee 1995]. India

also had a relatively better developed network of agricultural research centers and universities.

Another very important factor is that wheat production in Pakistan usually follows a pattern of double cropping with rice. There is widespread concern that continuous double cropping of cereals, especially wheat and rice, which require very different soil and water management practices, is an unsustainable cropping pattern [Pingali and Rosegrant 1994; Byerlee and Siddiq 1994; Cassman and Pingali 1995, Ali 1996]. Both wheat and rice are the major food crops of Pakistan, rice is also a major source of foreign exchange earning, and double cropping of the two cereals is widely practiced in the country. The small farmers have to struggle very hard to maintain their meager income level, as the support price, which ought to cover the cost of production and provide necessary mark-up, does not dole out the promise that will help increase productivity. The Agricultural Pricing Commission (APCom) in Pakistan was set up as late as in 1981. By that time, most of the damage to the producers' confidence had already been done. The experts at APCom, of course, make efforts to adopt the standard procedure for computing the support prices.[15]However, their efforts are rendered futile when the decisions taken do not follow the Commission's recommendations and are largely governed by the socio-political pressure as well as by finance controlling authorities. The evidence listed in Table 8, shows that support price has hardly been offering the farmers any economic profit on their hard labor. Indeed, APCom itself appears to have been very modest in its recommendations. The figures listed in Table 8 show that the wheat support price mark up on farmers' cost of production has been low in Punjab, particularly for the first two years, 1987 and 1988. The mark up is generally higher in Sindh where most of large landholdings exist, giving the rich landlords advantage over the small holders and tenant farmers. Further, the cost calculation procedures overlook the opportunity cost of family labor which is high with the small farmers. Nor do the procedures take into account the costs associated with commodity assembly, storage, transport, handling,

[15] The general criteria for determining the support price of a commodity includes the following specific dimensions: i) cost of production of crops; ii)export and import parity of prices; iii) farmers' input and output price parity; iv)domestic demand, supply and stock position; v)world demand, supply, stock and trade; vi) domestic and international prices; vii) probable impact on other competing crops; viii) likely impact on the cost of living; ix)production response to prices; x)risk factor; xi)effect on industrial cost structure. See, Niaz (1995).

spoilage, and risk. All these costs multiply in an economy fraught with a plethora of both policy weaknesses and market distortions. This promise of a meager income to the

Table: 8 **Wheat Support Price as Percentage of Production Cost♦ (Pakistan: 1986-93)**

Year	Province	
	Punjab	Sindh
1986-87	104	115
1987-88	104	116
1988-89	107	106
1989-90	119	122
1990-91	120	119
1991-92	113	114
1992-93	106	108

Source: M. Shafi Niaz, Pricing of Farm Produce in Pakistan, 1995, Table 7.1, p. 102.
♦Cost of production includes land rent

poor wheat growers in Pakistan is nowhere near the rich American farmers who have on average received, indiscriminately, 50 cents in subsidies for every dollar of their earnings from farming. Subsidies also double the incomes of the farmers in the EU. In Japan twice as much of the farmers' money comes from the state as from land. And farmers in Switzerland receive 80% of their income in states subsidies.[16]

In Pakistan, the mechanism and implementation of government wheat pricing are equally responsible for the failure to achieve the proclaimed aims of the policy. In the world we live in, wheat protection is a centuries old and widely phenomenon. The history of Europe's wheat market shows that they have found a pretext in every age to protect their farmers. In the 19th century that pretext was unfair competition from cheap American and Australian wheat. After the second world war it was food security, and afterwards it became preservation of the rural character. The Common Agriculture Policy (CAP) of the EU guarantees the income support to producers by manipulating the market so as to bring about a high price, a price which in itself provides adequate remuneration to the farmers. The internal price level is partly maintained by a variety of

[16] See, *A Survey of Agriculture,* The Economist, December 12th 1992.

protective devices at the common frontier of EU. These prevent imports from the low price world market from eroding the internal price level. During 1967-72, the Community support prices of wheat ranged between 200-254 percent of world market prices [Swann 1978, Table 8, P. 178]. But the figures listed in Table 9, comparing the support price of wheat in Pakistan with its domestic and world market price, tell a different story. The market price has been higher than the support price for all but two years reported in Table 9, 1986-87 and 1999-00, when market price is just equal to and one percent lower than the support price respectively. Such a scenario shows complete futility of the wheat support price policy since, theoretically, there is supposed to be an intervention price which is set below the support price. The government ought to begin the support procurement only if the market price falls below the intervention price. Such a mechanism prevents over-production from pushing the price level down in the market, as the government takes off the market the excess of supply over demand at the pre-determined support price level. [17] The comparison of the support price and market price given in Table 9 shows that in Pakistan's agricultural policy, no such mechanism is in place, i.e. market, with the exception of two years, has always been offering a mark up on the support price, ruling out the government obligation to procure wheat. This clearly shows that the support price has not been offering enough mark up to the producers to give them the incentive for increasing production to a level that warrants government's support buying. And yet the irony is that government has been doing the procurements all these years.

In Pakistan, the Provincial Food Departments and Pakistan Agricultural Services and Storage Corporation (PASSCO) are the implementing agencies for the support price of wheat. However, rather than offering the support price as a cushion to the farmers, the main purpose of government procurements has been the maintenance of food security reserves and supply of food to urban population at low and subsidized prices. The concept of support price does not require to impose any restriction on the movement of the commodity. However, district administrations have been imposing restrictions on the

[17] The intervention prices of the CAP have been 5-7 percent lower than the support price [see, Swann 1978, p.164].

movement of wheat in the post harvest months to facilitate fulfillment of procurement targets assigned to these agencies by the government. This action depresses the prices of

Table: 9

Comparative Wheat Prices and Procurement Levels (Pakistan: 1980-2000)

Year	Price (Rs per 40 kg)			% Difference		Procure-ment♣ Million tonne
	(a) Support Price	Market Price (b) Domestic♦	(c) World▲	b-a/a	c-b/b	
1980-81	58	60	n. a.	3.44	n. a.	3.99
1981-82	58	62	n. a.	6.89	n. a.	3.13
1982-83	64	67	272	4.68	305	3.82
1983-84	64	71	267	10.94	276	2.28
1984-85	70	77	217	10.00	181	2.53
1985-86	80	82	188	2.50	129	5.04
1986-87	80	80	186	-	133	3.98
1987-88	83	85	220	2.41	158	3.49
1988-89	85	93	284	9.41	205	4.13
1989-90	96	102	296	6.25	190	4.41
1990-91	112	121	292	8.03	141	3.16
1991-92	124	134	290	8.06	116	3.25
1992-93	130	139	253	6.92	82	4.12
1993-94	160	170	297	6.25	75	3.64
1994-95	160	176	282	10.00	60	3.74
1995-96	173	185	365	6.93	97	3.45
1996-97	240	273	342	13.70	25	2.72
1997-98	240	259	308	7.91	19	3.98
1998-99	240	261	290	8.75	11	4.07
1999-00	300	297	235	-1	-20	8.55

Source: Pakistan Journal of Agricultural Economics, Vol. 4, No. 1, January 2001,
Statistical Appendix, Table 14 & 19.

♦Average market price of Multan, Okara and Hyderabad during post harvest period, April-July.

▲US Western white (FOB, Pacific).

♣Procurement by government agencies, PASSCO and Provincial Food Departments.

wheat in the open market in the surplus producing areas which is contradictory to the aims of the support price policy. Any consistent policy will help remove the distortions created by the market itself, in order to facilitate rather than hinder the free movement of wheat. Moreover, unless the market price falls below the intervention price, the

government agencies should not ask, leave alone compel, the growers to sell wheat at support price. In practice, what happens is that the federal and provincial governments fix the targets for procurement by agencies as well as by geographical areas going down to the district and tehsil level. When it is felt by the agencies that the procurement targets given by their governments would not be accomplished, they resort to coercive methods. The APCom's Support Price Policy Report on wheat crop of 1984-85 states that:

> "*In the Wheat Standing Committee meeting, the growers expressed concern over the forced purchase of wheat by the government agencies in certain areas. In some cases, the traders who purchased wheat from the growers at a price higher than the support price were reported to have been compelled to surrender the wheat thus purchased. This meant to discourage and even penalize the traders for buying wheat from the farmers at free market price which was higher than the support price [Niaz 1995, p.217]."*

In the Support Price Policy Report on wheat crop of 1985-86, it was again emphasized that:

> *"It appears that the price policy implementing agencies and administrative departments do not observe the distinction between the 'support price' and the 'procurement price' in actual procedure. According to the reports received by APCom, the provincial governments have been procuring wheat harvested in April-May 1985 at the support price, even though the market price prevailing in the surplus wheat producing areas was higher than the support price. In doing so, these agencies, in order to meet their procurement targets and in concert with local administration have reportedly been forcing the growers to sell their wheat surplus to them at the support price [Niaz 1995, p.217-18]."*

Up to 70% of Pakistan's wheat production, which totaled 21 mullion tonnes in 2000, is consumed locally, leaving a marketable surplus of 5-6 million tonnes [Madely 2003,

P.175]. The figures listed in Table 9 show that government has been regularly buying about 4 million tonnes for strategic reserves and buffer stocks, leaving very little for disposal on the export market. The government has largely carried out wheat procurements for reasons of food security. After procurement, the government has been selling wheat to flour mills at subsidized prices that are then passed to the consumer.[18]

Table 9 also provides the comparison of the domestic market price of wheat in Pakistan with its price in the world market. And the figures present a scenario which further reveals the worthlessness of government's support price policy. Till 1992, the world market price of wheat has been higher by a wide margin of well above 100 percent, the widest gap being in 1983, when the wheat growers selling in Pakistan were at a disadvantage of such a magnitude that world market prices were 305 percent higher than what they were being offered in the domestic market.[19] It is not unfair to suggest that such a wide disparity between the wheat price in the domestic and international market is to be blamed on the wheat pricing policy, though the inconsistencies and the contradictions of the latter were compounded by overvalued exchange rate and the tariff protection of the nonagricultural sector. The gap, however, appears to be constantly narrowing after 1995-96, and the figures show that, for the first time in 1999-00, owing to the higher support price incentive, the domestic market price of wheat in Pakistan was 20 % higher than its international price. But soon afterwards, Pakistan came under pressure from Asian Development Bank (ADB), a sister organization to the World Bank, to reduce its support for the poor farmers. In early 2001, the government began to implement the conditions of a loan to the agricultural sector from the ADB. These conditions require a move away from government intervention towards a market-based system, with the emphasis on deregulation and liberalization.[20] Under the rules of the

[18] Apart from coercive and unlawful procurement of the agencies, the small-scale, and resource-poor farmers in Pakistan, as elsewhere in the developing world, cannot mange to get a fair deal in the market either. Not only that the small farmers do not have adequate storing facilities, they are also under pressure to sell their produce quickly for repaying high-interest loans, taken from middlemen and the dealers, and purchasing the inputs for the next cropping cycle. Consequently, majority of the farmers are at a disadvantage while disposing off their surplus production.

[19] Poor farmers were getting this deal in the scenario of a world wheat market which was widely considered low priced because of the unloading of the developed countries' highly subsidized surpluses, mostly from the EU and the U.S, usually at a loss.

[20] The government slashed its procurement target from 8.5 million tonnes to 4 million tonnes for 2001 and shut down a large number of procurement centers. These changes had a dramatic effect on the wheat

WTO, Pakistan is not obliged to reduce its support to wheat farmers, provided the value of the support did not exceed 10 percent of wheat output [Madeley 2003]. It is the influence of the ADB, IMF and the World Bank which may cause further damage to country's small farmers and threaten the self-sufficiency in wheat production. Finally, though the driver wore coat of a different color, the lesson must be learned from the devastating consequences of Mexico's experience of deregulating and liberalizing its corn market in the 1990s. [21]

Conclusion and Recommendations

Given that wheat is the most strategic commodity in Pakistan and majority of the wheat growers are poor farmers, their crop ought to be handsomely protected by the government. In America, farmers are less than 2% of the workforce, but continue to be one of the country's most formidable lobby. In the EU, the council of farm ministers has far more political weight than farming's economic standing would merit. But the farmers in Pakistan generally lack political power. Paradoxically, wheat pricing policy has caused that power to further weaken when it should have strengthened it. Without the government policy providing them cushion, the farmers in Pakistan when exposed to swings in prices neither have sufficient information nor the access and affordability to use future markets and insurance to protect themselves.

The kind of support price regime that has been exercised in Pakistan is more close to the practice of procurement price. In this system, there is no tangible restriction on the sale of the produce by the farmers in the free market unless the government declares to buy at the fixed procurement price. Such a policy of procurement was followed in Pakistan after it gave up its policy of monopoly purchases of wheat at the end of 1950s. From the

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market. Farmers had increased wheat output in response to the 300 rupees per 40kg support price announced by the government and in the light of the size of procurement made by the government in 2000 (see, Table 8). With the dramatic reduction in the 2001 target, farmers rushed to sell their harvest as fast as possible, in the hope that they could obtain the procurement cushion before prices began to fall [see, Madeley 2003, P. 176]. Such a procurement policy is clearly arbitrary and not obligatory which is practiced in EU, U.S. A. and many other developed countries for effectively protecting their farmers.

[21] Corn is Mexico's staple food, cultivated on 40% of the country's land. After becoming member of the North American Free Trade Agreement (NAFTA) in 1994, Mexico dropped all subsidies on corn, as NAFTA believed that the country's *comparative advantage* lied in importing corn from U.S.A. Subsequently, the production of corn and other basic grains fell by nearly half: 25 million acres went unplanted and by 1995 some 2 million peasant farmers migrated to already saturated urban centers. In 1996, there were no corn surpluses in U.S.A. Consequently, the corn prices tripled in Mexico and per capita

farmers' standpoint, the procurement price, being lower than the market price, works as a disincentive for increasing production. Indeed, the objective of achieving self-sufficiency in wheat has frequently been in conflict with keeping the cost of production of manufacturing goods as low as possible, particularly those destined for exports so that they remain competitive in the international market. [22]

If Pakistan were to give up taxing its wheat growers and invest in rural infrastructure instead, the annual gains could increase phenomenally. Good farm policies offer good value for money, always and everywhere. They play such a valuable social and economic role that it is worth spending scarce funds to keep them in place. However, the policies must not pursue foolish and short-sighted ends, or even wise ends wastefully. A coherent wheat policy in Pakistan is faced with the challenge of achieving the following paradoxical objectives:

- to keep prices both stable and profitable for wheat growers;
- to guarantee affordable supplies of food to the vulnerable groups;
- to keep wheat growers vibrant by supporting their income;
- to develop the rural communities;
- to ensure both sustainability and self-sufficiency in wheat production.

All policies aiming at increasing wheat production and stabilizing wheat prices must be formulated keeping in view the guidelines offered by the positive economic theory. One of the important guideline is that at upper income levels consumer grow less sensitive to the price of food, since as people grow wealthy food absorbs a declining share of the family budget. This implies that rather than providing blanket protection to the wheat consumers, the policy should be providing income support or the food vouchers only to the vulnerable groups. Also, the food security program must not be mixed up with the support price program. Any purchases required to be made for food security reserves ought to be made at market prices of wheat. Protecting wheat producers as a policy choice can keep the consumers welfare to a minimum in the short-run, but protecting

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corn consumption dropped three times. In dry northern parts of the country, women and children reportedly hijacked trains from U.S.A. carrying corn to Mexico [see, Chaudhry 2001, P. 19].

[22] This in turn required low food prices both for appeasing the vocal urbanites and compensating the low wage workers in the manufacturing sector.

wheat producers by economic compulsion may lead to extreme suffering of the consumers in the long-run.

It is high time that Pakistan's educational and research institutions accord top priority to higher education and research in agricultural economics. In almost all general universities of Pakistan, the agricultural economics is considered to be a poor relation and an outcast in the curricula. Everywhere, it is an optional subject which is usually shunned by the bright and forward looking students. Although all the agricultural universities of Pakistan are housing departments of economics and rural sociology, their teaching and research standards are generally unsatisfactory and devoid of theoretical perspectives, and the same goes for a lot of the work in agricultural economics which is carried out in research institutions and government agencies. The policy makers in developing countries like Pakistan, almost always follow the development models and patterns which are in vogue in the developed part of the world. They must also remember that Economic Research Service of America's agriculture department houses one of the largest collection of economists in the world, and the highest paid agricultural economists are found not in agricultural countries like Pakistan, but in Tokyo and Brussels.

Finally, it was a very positive move on the part of Pakistan to join hands with the G21 at Cancún meeting. Developing countries must put their own house in the order that is warranted in an unfair world, made so by the farm policies of the developed countries. Farming has been discussed in all of the past rounds of world trade talks. In other words, the talks to liberalize farm trade have been going on for more than 40 years. Throughout the 20th century, the developed countries have preached capitalism in one breath and banned food imports in another. But while formulating the wheat price policy, Pakistan must not pin her hopes on the solutions that the Doha Round is being looked forward to offer on farm subsidies. If the history lessons are to be trusted, the Uruguay Round was *concluded* only yesterday.

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