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**PRICE STABILIZATION
AND THE COST
OF FOOD STOCKS**

**PAUL DOROSH
QUAZI SHAHABUDDIN
NASER FARID**

JUNE 2001

FMRSP Synthesis Report No. 1

FMRSP Bangladesh
Food Management & Research Support Project
Ministry of Food, Government of the People's Republic of Bangladesh

International Food Policy Research Institute

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The views expressed in this report are those of the author and do not necessarily reflect the official position of the Government of Bangladesh or USAID.

FMRSP Bangladesh

**Food Management & Research Support Project
Ministry of Food, Government of the People's Republic of Bangladesh**



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1. INTRODUCTION

Ironically, less than one year after the massive floods of 1998 and the concerns of imminent food shortages and high prices, excessively low prices and surplus dominated the food policy debate in late 1999. Bumper wheat and boro rice in the first half of 1999, followed by a bumper aman harvest during the second half of 1999 and early 2000 resulted in large market supplies and surpluses, leading the government to increase procurement targets and resulting in a large build-up of public stocks. Such rapid changes in production environment and market conditions illustrate both the natural instability of foodgrain production and markets in the country.

Stabilizing foodgrain prices is a major goal of food policy. Foodgrain prices are crucial for both producers and consumers, especially the poor. Sharp increases in foodgrain prices significantly lower the real income of poor households, a large proportion of whose budget is spent on foodgrains. At the same time, instability in producer prices increases farmer's uncertainty and discourages private investment in agriculture. This classic conflict of interests is best addressed in the medium term through liberalization of trade and the creation of conditions for efficient production and marketing. In the long run, of course, the solution lies in the enhanced productivity of land that will lower unit cost of production, the benefit of which can be passed on to the consumer without hampering the production incentives of farmers.

Yet, in the last two decades, Bangladesh has witnessed dramatic changes in its agricultural production environment. Dissemination of the new technology in the form of improved seeds, expansion of irrigation and increased fertilizer use, has led to substantial increases in productivity, making possible a long-term decline in the real price of rice

from the mid-1980s to the mid-1990s. At the same time, as sales of foodgrain have increased, the foodgrain market has become well-integrated and efficient, though some pockets of underdevelopment and isolation remain. Moreover, because of the sharp increase in boro production, seasonal price variations have been reduced and fluctuations in annual production and prices have diminished. Finally, the trade liberalization of the early 1990s has added to national food security by enabling the private sector to import foodgrains in times of domestic production shortages. For example, following the disastrous 1998 flood, private sector imports contributed significantly to national foodgrain supply.

In view of the above, the need of the government to intervene directly in the market to ensure stable food supplies has been markedly reduced. Nonetheless, an important role for the government remains in providing emergency relief during periods of natural disasters, alleviating chronic food insecurity through targeted food distribution to poor households, and taking steps, when necessary, to stabilize food markets. Adequate *foodgrain stocks* are crucial to maintain the government's ability to address emergency needs and to help stabilize markets. Moreover, the government plays important roles in all aspects of food security, through its policies, programs and other interventions affecting availability of food, access to food, and utilization of food and nutrition.

This report examines price stabilization and public stock issues in Bangladesh, drawing on earlier studies of stocks by Goletti and Rich (1998) and Dorosh and Farid (2001), as well as studies on price stabilization and procurement (Shahabuddin and Islam (1999); Dorosh and Shahabuddin, (1999); Dorosh, (1999)). Chapter 2 presents a short overview of lessons from stock modeling exercises, along with a brief summary of recent stock policy. Chapter 3 discusses domestic procurement and distribution and their impact on prices and farmer incomes. Chapter 4 presents an analysis of the costs of the PFDS

and the distribution of the benefits. Conclusions and policy implications are given in Chapter 5.

2. PUBLIC FOODGRAIN STOCKS AND PRICE STABILIZATION

Despite large public support for rice price stabilization, the economic case for stabilization is not very strong.¹ The analysis by Gulletti (1994) and Brennan (1995) leaves doubt about the advisability of pursuing price stabilization. If economic benefits exist at all, these are likely to be rather small, unless households are extremely risk averse. Even as a mechanism to reduce poverty in the short run, price stabilization is not very effective. Targeted programs conducted with wheat would seem to be more effective (Dorosh and Shahabuddin, 1999).

It may be mentioned here that the changes in the production pattern have reduced the need for government intervention to stabilize rice prices. The increase in the size of the boro harvest has largely reduced the seasonality of production and prices in Bangladesh and along with it, the susceptibility of total production to adverse weather conditions. For example, a poor aman harvest is usually followed by a bumper harvest in the subsequent boro and aus seasons. This increased stability of production has translated into increased price stability as well, as we observed earlier.

LESSONS FROM MODELING OF STOCKS

Various empirical modeling exercises have focused on analysis of stocks and their implications for price stabilization (Goletti, Ahmed and Chowdhury, 1991; Brennan, 1995; Goletti 1998). These analyses have highlighted several major lessons, including

¹ Although traditional welfare economics often conclude that commodity price stabilization schemes are economically wasteful, most developing countries adopt some type of stabilization policy to counter price instability arising from shocks in the domestic supply of foodgrains. This is so because the assumption that the consumer can save enough in times of low prices to pay for higher prices later on is unrealistic in economies such as Bangladesh that have widespread poverty and imperfect capital markets (Ahmed and Bernard, 1989).

the importance of clarifying objectives (price stabilization, working stocks for the PFDS), and that lowest costs can be achieved through using rice for rice price stabilization and wheat for foodgrain distribution to the poor. These analyses have also emphasized that “optimal stock” should not be thought of as a single number, but as a path of stock levels over time that depend on policy regime and policy objectives. In particular, significant savings can be achieved through reliance on international trade (importing in times of shortage and exporting in times of surplus) to supplement moderate levels of stocks. As shown in Dorosh and Shahabuddin (1999), private sector imports of rice following the 1998 floods helped stabilize rice prices at no cost to the public exchequer, keeping domestic prices from rising above import parity levels.

PFDS Stock Policy and Historical Stock Levels

PFDS stock policy and stock levels have changed over time along with the overall size of the PFDS and the major distribution channels (Figures 2.1, 2.2). In the late 1980s and early 1990s, PFDS total annual distribution ranged from 2.16 to 2.97 million MTs, with much of the foodgrain distributed through ration channels, involving subsidized sales of foodgrain to ration cardholders. Stock levels in 1989/90 and 1990/91 averaged 1.137 million MTs,² equal to 6.66 and 5.38 times monthly average distribution in these years (Table 2.1).

Major reforms in the PFDS took place in the early 1990s with the elimination of major rationing channels (Statutory Rationing and Rural Rationing) and greater emphasis on targeted distribution. Total distribution was reduced to an average of only 1.53

² Unless otherwise noted, all foodgrain stocks figures in this report indicate net stocks, i.e. gross stocks less a deduction for foodgrain in transit. In 2000/2001, 15 thousand MTs of rice and 88 thousand MTs of wheat were considered to be “in transit”.

Table 2.1 — Annual PFDS Distribution and Public Stock Level

Year	Average Monthly Stock Level (000 MT)			Total PFDS Distribution (000 MT)			Monthly Average Stock to Monthly Average Distribution		
	Rice	Wheat	Total	Rice	Wheat	Total	Rice	Wheat	Total
1988/89	490	640	1130	58	188	245	8.48	3.41	4.61
1989/90	660	541	1201	56	124	180	11.73	4.36	6.66
1990/91	549	513	1062	81	117	198	6.78	4.40	5.38
1991/92	491	324	815	63	132	195	7.76	2.45	4.17
1992/93	594	592	1186	40	50	89	15.01	11.88	13.27
1993/94	258	475	733	29	86	115	8.85	5.55	6.39
1994/95	177	400	577	27	104	131	6.46	3.86	4.40
1995/96	401	488	889	49	100	150	8.13	4.88	5.95
1996/97	551	398	949	62	54	116	8.95	7.31	8.18
1997/98	297	455	752	44	91	135	6.74	5.00	5.57
1998/99	424	562	986	44	134	178	9.60	4.20	5.54
1999/00	666	682	1348	73	85	158	9.12	7.99	8.51
2000/01	463	506	969	52	105	158	8.87	4.80	6.15

million MTs from 1993/94 through 1996/97. Stock levels were reduced as well, with average annual stocks ranging from 573 to 950 thousand MTs over this period.

Total foodgrain stocks since the 1998 floods, however, have increased substantially to an annual average of 1.348 million MTs in 1999/2000 and 951 thousand MTs in 2000/2001. This very large PFDS stock build-up occurred mainly because of

delayed import arrivals and relatively high levels of domestic procurement in response to falling market prices immediately after harvest of consecutive bumper crops in boro 1999, aman 1999/2000, boro 2000 and latest aman of 2000/2001. 604 thousand metric tons of rice were procured from the bumper boro harvest in 1999, and this, along with delayed arrivals of food aid for flood rehabilitation led to a sharp increase in stocks. Stocks peaked at 1.631 million metric tons in December 1999 (654 thousand metric tons of rice and 976 thousand metric tons of wheat).³

Periods of Excessively Low Stocks

During the 1990s, there were three episodes when stock levels were precariously low at approximately 200 thousand MTs or less of rice or wheat (Table 2.2). The first episode occurred from September 1994 through April 1995, when aman procurement failed because drought severely damaged the 1994/95 aman crop, and government commercial imports were delayed by up to 15 months because of the failure of suppliers to deliver according to contract schedules.

A second period of low stocks, from December 1997 through April 1998, followed an unexpectedly poor aman harvest in November/ December 1997. In that year, a short drought during the critical flowering stage of the rice plants resulted in widespread prevalence of empty husks (*chita*), and an 7.35 percent reduction in the aman harvest. Prices rapidly rose above the fixed procurement price, so that regular procurement failed. Difficulties with contracts for government commercial imports

³ Subsequently, careful management of the PFDS, including cancellation of commercial wheat imports, reductions of wheat distribution and increases in rice distribution, reduced the stock level and essentially cleared all the old stock by June 2001.

Table 2.2 — Periods of Low and High Stocks in the 1990s

Low Stock Periods									
Periods	Average Monthly Stock			Avg. Monthly Distribution			Stock to Distribution		
	Rice	Wheat	Total	Rice	Wheat	Total	Rice	Wheat	Total
1994/95 (Sep-Apr)	130	370	500	33	113	145	3.98	3.29	3.44
1997/98 (Dec-Apr)	205	313	518	58	135	193	3.55	2.31	2.68
1998/99 (Aug-Oct)	400	162	562	55	46	101	7.23	3.54	5.56

High Stock Periods									
Periods	Average Monthly Stock			Avg. Monthly Distribution			Stock to Distribution		
	Rice	Wheat	Total	Rice	Wheat	Total	Rice	Wheat	Total
1996/97 (Jul-Jun)	554	309	863	53	84	136	10.54	3.70	6.34
1999/00 (Jul-Jun)	662	602	1263	73	85	158	9.07	7.05	7.98
2000/01 (Jul-Apr)	682	310	993	68	127	194	10.05	2.45	5.11

limited international procurement as well, and rice stocks fell to only 137 thousand MTs in March 1998.⁴

Stocks were also uncomfortably low from August through October 1998, when widespread floods destroyed aman rice seedlings, ultimately reducing the November/December 1998 harvest. In response to appeals for aid in late August 1998, donors pledged 1.083 million MTs of foodgrain for flood relief, but major food aid arrivals were not expected until November. Thus, with only 231 thousand MTs of wheat stocks, expansion of distribution through Vulnerable Group Feeding (VGF) was limited

⁴ Shortly thereafter, in April 1998, the Prime Minister announced an official stock target of 1.0 million metric tons.

to 64 thousand MTs per month (half Rice and half Wheat) instead of the 141 thousand MTs of Wheat per month proposed by the World Food Programme.⁵

Current foodgrain stocks (as of the end of April 2001) are 1.004 million metric tons (463 thousand metric tons of rice and 541 thousand metric tons of wheat). End-June 2001 stocks are expected to be 904 thousand metric tons (535 thousand metric tons of rice and 369 thousand metric tons of wheat).

Periods of Excessively High Stocks

Though the situation often appears less urgent than for low stock periods, high stock periods can be problematic as well, because of quality deterioration of foodgrain in storage. Although it is technically possible to store rice and wheat for periods exceeding one year, significant deterioration in rice quality (especially discoloration) often occurs in rice stored for more than six months in PFDS godowns. Wheat storage problems are fewer, particularly in government silos, though in recent years there have also been serious quality problems with imported wheat stored for more than six months.

There have been three periods of excessively high stocks since the mid-1990s. During the first period, from July 1996 through June 1997, average rice stocks were 554 thousand MTs, while average monthly rice distribution was only 53 thousand MTs. Thus, rice stocks were on average equal to 10.54 months of rice distribution. This situation occurred because of the delayed delivery of 491 thousand MTs of rice tendered by the government in 1994/95 that did not arrive until 1995/96.

The other two periods of high stocks followed the 1998 floods. Average monthly rice stocks exceeded 600 thousand MTs in both 1999/2000 and the first eight months of

⁵ Subsequent food aid arrivals enabled a large expansion in Food For Work in early 1999, however. See Dorosh (1999).

2000/2001, equal to 9.1 and 10.1 months of distribution, respectively. Wheat stocks were also high in 1999/2000, on average equal to 7.0 months of distribution, and some imported wheat (apparently already old when it arrived in Bangladesh) severely deteriorated in quality.

These problems of stock deterioration during periods of high stocks can be overcome through increases in public distribution. As is shown in sections 3 and 4, public distribution of foodgrains typically involves large subsidies. An alternative approach, open market sales at a wholesale level through public auction (and possibly simultaneous domestic procurement through competitive tender) would enable to the Government of Bangladesh to rotate stocks at significantly less fiscal costs.

3. DOMESTIC PROCUREMENT, OPEN MARKET SALES AND MARKET PRICES

Recent evidence suggests that the private foodgrain trade can contribute significantly to price stability. In fact, with trade liberalization, private sector imports have effectively provided a price ceiling at import parity levels following poor rice harvests in 1994/95, 1997/98 and more recently, in the aftermath of the flood in 1998.⁶ However, rice price stability remains a concern, since export parity does not provide an effective floor price. Successive good rice harvests in Bangladesh brought rice prices below export parity in recent years. Exports did not occur, partly because market links were not established, and also because of the lack of uniform grades and standards for Bangladesh rice. Investments in mechanical graders and the establishment of grades and standards consistent with current international trade could thus help prevent large price declines by making export possible following bumper harvests.⁷

The alternative to making the investments required and encouraging private sector exports to support producers' price following bumper harvest is, of course, domestic procurement by the government. The performance of domestic rice procurement from 1987/88 to 1998/99 is summarized in Table 3.1 and 3.2. It is observed that boro procurement has been much more reliable than aman procurement. Procurement of boro

⁶ This positive experience with private sector imports, however, does not completely eliminate the need for government imports and rice stocks. Import parity prices in years of tight world markets may be unacceptably high. In such cases, subsidized sales of government imports and rice stock may be needed. Thus, some security stocks are required equal to at least three months of planned distribution, because of delays in import arrivals.

⁷ It may be mentioned here, however, that the analysis of comparative advantage of production of different crops demonstrates that the farmers in Bangladesh are efficient producers of rice for import substitution but not for export. In fact, when compared with economic profitability estimates of many nonrice crops, Bangladesh has more profitable options other than production for rice export (Shahabuddin 2000, 2001).

Table 3.1 — Domestic Procurement of Rice and Procurement Prices, 1987/88 - 2000/01

Season	Category of Procured Rice	Procurement Target (000 MT)	Actual Procurement (000 MT)	% of Actual to Targeted Procurement	Procurement Quantity of Procurement Zone ^a	Procurement Price (Tk/Kg)	Procurement Zone ^a Wholesale Price (Tk/Kg)
Apr 87 - Oct 87	Boro	200	141	70.5	n.a.	8.25	9.67
Nov 87 - Mar 88	Aman	120	49	40.8	n.a.	8.25	8.83
Apr 88 - Oct 88	Boro	200	357	178.5	n.a.	8.25	8.80
Nov 88 - Mar 89	Aman	250	61	24.4	n.a.	8.66	9.27
Apr 89 - Oct 89	Boro	525	336	64.0	n.a.	8.66	9.22
Nov 89 - Mar 90	Aman	250	421	168.4	n.a.	9.07	9.12
Apr 90 - Oct 90	Boro	400	470	117.5	n.a.	9.71	9.54
Nov 90 - Mar 91	Aman	425	162	38.1	n.a.	9.71	9.91
Apr 91 - Oct 91	Boro	500	568	113.6	399	9.90	10.49
Nov 91 - Mar 92	Aman	550	363	66.0	278	10.10	10.51
Apr 92 - Oct 92	Boro	500	503	100.6	0	10.10	10.48
Nov 92 - Mar 93	Aman	200	142	71.0	111	8.66	7.89
Apr 93 - Oct 93	Boro	133	2	1.5	138	9.55	7.59
Nov 93 - Mar 94	Aman	200	14	7.0	9	8.51	9.23
Apr 94 - Oct 94	Boro	250	165	66.0	141	9.19	10.66
Nov 94 - Mar 95	Aman	0	42	-	0	9.11	11.86
Apr 95 - Oct 95	Boro	300	244	81.3	202	11.25	12.14
Nov 95 - Mar 96	Aman	200	51	25.5	32	11.00	11.60
Apr 96 - Oct 96	Boro	420	416	99.0	168	11.00	10.07
Nov 96 - Mar 97	Aman	250	201	80.4	128	10.50	8.85
Apr 97 - Oct 97	Boro	250	243.0	97.2	184.0	11.00	9.19
Nov 97 - Mar 98	Aman	300	0.6	0.2	n.a.	10.70	11.31
Apr 98 - Oct 98	Boro	400	264.0	66.0	74.1	12.00	12.68
Nov 98 - Mar 99	Aman	250	0.0	0.0	0.0	12.00	14.05
Apr 99 - Oct 99	Boro	600	604.4	100.7	147.9	12.00	12.37
Nov 99 - Mar 00	Aman	250	235.0	94.0	60.1	12.50	11.58
Apr 00 - Oct 00	Boro	600	604.0	100.7	120.8	12.50	10.40
Nov 00 - Mar 01	Aman	250	236.0	94.4	n.a.	12.5	11.30

Note: ^a includes Rangpur, Dinajpur and Bogra districts.

n.a. Means not available.

Source: DAM; FPMU and DG Food in Dorosh and Shahbuddin (1999), Working Paper

Table 3.2 — Aman and Boro Procurement, 1991/92 - 2000/2001

Season	Procurement Target (000 MT)	Actual Procurement (000 MT)	% of Actual Procurement to Targeted Procurement	Procurement Price (Tk/ Kg)	Farmgate Price ^a (Tk/ Kg)	Price Ratio (percent)
Aman (1991/92 - 00/01)	245	128	52.4%	10.56	9.74	109.7%
Boro (1991-2000) ^b	415	380	91.7%	11.13	9.90	113.3%
Aman Shortfall Years ^c	190	22	11.3%	10.26	10.45	98.6%
Aman Normal Years ^d	300	235	78.5%	10.85	9.02	120.7%

Notes: ^a The farmgate price is estimated as the wholesale price in Rangpur, Dinajpur and Bogra districts times 0.9.

^b Excluding 1993, (a year when the procurement program was abandoned).

^c Aman shortfall years: 1993/94, 1994/95, 1995/96, 1997/98, 1998/99.

^d Aman normal years: 1991/92, 1992/93, 1996/97, 1999/2000, 2000/2001.

Source: Based on Shahabuddin and Dorosh (1999).

exceeded 80 percent of the target in 9 out of 13 years and failed to reach at least 60 percent of the target in only one year (1993). Aman procurement, on the other hand, exceeded 80 percent of the target in only 2 out of 12 years (1989/90 and 1996/97), and failed to reach 60 percent of the target in 8 out of 12 years. In these eight years, aman procurement averaged only 18.5 percent of the target. This difference in procurement performance reflects the difficulty in forecasting the aman harvest and the future aman market price, the key elements in determining an appropriate procurement price for aman.⁸ Moreover, the procurement price set in the boro season has been excessively high in 3 out of 4 years in recent period, resulting in extra costs to the government and

⁸ During the last six years, from 1993/94 through 1998/99, aman procurement exceeded 30 percent of the target only in 1996/97. In that year, the average price in the major procurement zone (calculated as the average price in Rangpur, Dinajpur and Bogra districts) was Tk. 1.65/kg *below* the procurement price. In the five other years, the average price in the major procurement zone was Tk. 1.35/kg *above* the procurement price, and procurement averaged only 8.9 percent of the target (Figure 3.1).

windfall profits to those who are fortunate enough to sell at the procurement centres. Moreover, procurement prices substantially above market prices encourage rent-seeking behaviour and also the corruption of public officials involved in the public procurement system. The determination of procurement prices at the level of price support is thus a critically important task in order to ensure adequate production incentives to the farmers, while at the same time minimizing costs to the public exchequer.

A number of factors contributed to the unsatisfactory performance of the domestic procurement program in the past. Excessive commercial imports in the public sector, particularly in good harvest years (even in some flood years) used up effective storage capacity leading to a failure in the procurement program in the next harvest. Also, there are shortcomings in the procurement system that tend to limit the access of the farmers so that they are obliged to sell to the private traders at a lower price. These limitations are well known and have been widely documented (The World Bank, 1990, Osmani and Quasem, 1990). An inadequate number of procurement centres for a comprehensive coverage of the production areas, limited financial resources of the government, institutional impediments to speedy purchase from and payments to small sellers, and finally, collusion between the traders and the officials, which enable the traders to capture the margins between the market price and the procurement price.

A recent study (Shahabuddin and Islam, 1999) has also shown that the participation of farmers, specially small and medium farmers in the domestic procurement program is disappointingly low (only 10 percent).⁹ A number of policy

⁹ The information was collected through field surveys in three selected districts, namely Bogra, Dinajpur and Naogaon of northern Bangladesh, particularly in Rajshahi Division where more than 80% of rice procurement takes place. The survey was carried out in the Boro season, 1998 at and around ten LSDs where farmers, traders, millers, sellers at LSDs, and LSD officials as well as other government officials were interviewed. In total, 340 people were interviewed, of which 160 were farmers of different categories, 60 were traders, 50 were sellers at LSDs, 50 were millers and 40 were LSD officials as well as other government officials.

recommendations were made by the study for increased farmers' participation in the program. These include, among others, (a) reorganization of the procurement system at Local Supply Depots (LSD) so that the "unofficial payments" to both officials/staff as well as to laborers were kept to a minimum; (b) to create "chatal" (drying facilities for farmers) through provision of appropriate credits; (c) to create temporary storage at LSD premises so that the paddy brought by the farmers was not damaged due to inclement weather; (d) to minimize harassments and the loss of time at LSDs since the loss of person days during the harvest and post-harvest period was critical for the farmers; (e) to initiate procurement program soon after harvests; (f) to minimize irregularities in weighing; and (g) to control excessive imports and make provisions for increased effective storage for smooth operation of the procurement program.

It may be emphasized here that most farmers sell rice in the market and the procurement program makes its contribution to incentives through its impact on market prices. The procedure of implementation is critically important in producing an impact on market prices. It is, therefore, worthwhile to assess the impact of the domestic procurement program on market price of rice. Dorosh and Shahabuddin (1999) provide estimates of the effect of domestic net procurement on market prices. The impact of net procurement on domestic prices has been calculated by considering net procurement as a reduction in net market supply, and then using an assumed own-price elasticity of demand for rice (Table 3.3). Thus, for example, in 1996, if the net procurement of 150 thousand metric tons did not take place, net supply would have been 1.9 percent greater. Assuming an elasticity of demand of -0.2 , then the market price would be 9.5 percent lower in the absence of procurement. Alternatively, using the simulated no-procurement

Table 3.3 — Impact of Domestic Net Boro Season Procurement, 1996-1999

	1996	1997	1998	1999
Boro	7.221	7.46	7.979	10.000
Aus	1.676	1.874	1.616	1.800
Total Production	8.897	9.334	9.595	11.800
Losses, seed, etc. (10 percent)	0.890	0.933	0.960	1.180
Net Production	8.007	8.401	8.636	10.620
Domestic Procurement (May-Nov)	0.416	0.243	0.322	0.602
Offtake from Government Stocks (May-Nov)	0.266	0.307	0.289	0.538
Net Domestic Procurement (May-Nov)	0.150	-0.064	0.033	0.064
Private imports	0.046	0.031	a.	b.
Private stock change	0	0	0	0
Supply/ Demand	7.903	8.496	8.603	10.556
Actual Price (May-Nov)	10.19	9.75	13.24	12.50
Procurement/ Total Production (percent)	4.7%	2.6%	3.4%	5.1%
Net procurement/ Total Supply (percent)	1.9%	-0.8%	0.4%	0.6%
Effect of Net Procurement on Market Prices				
Simulated Change in Price (percent)				
elasticity = -0.2	10.5%	-3.6%	a	3.1%
elasticity = -0.3	6.8%	-2.4%	a	2.1%
elasticity = -0.5	3.9%	-1.5%	a	1.2%

Notes: a. No estimate of the price effect has been made (see Dorosh and Shahabuddin, p-23)

b. Calculations show the impact of procurement on domestic prices if imports were zero (see Dorosh and Shahabuddin, p. 24).

Source: Dorosh and Shahabuddin (1999).

Table 3.4 — Costs of Domestic Boro Season Procurement, 1996-1999

	1996	1997	1998	1999
Domestic Procurement (May-Nov)	0.416	0.243	0.322	0.602
Procurement Price (Tk/kg)	11.00	11.00	12.00	12.00
Market Prices (Average May-July)				
National Average HYV Coarse (Tk/kg)	10.84	9.83	12.37	12.50
Rajshahi HYV Coarse (Tk/kg)	10.19	9.12	11.66	11.73
“Excess” Procurement Price (Tk/kg)				
Estimate I (Procurement price less Rajshahi Price)	0.81	1.88	0.34	0.27
Estimate II (Estimate I less 1999 Value of Estimate I)	0.54	1.61	0.08	0.00
“Excess” Cost of Procurement (mn Taka)				
Estimate I	337	456	111	161
Estimate II	226	391	25	0

Notes: Private imports are not included in total supply for calculations in 1998 and 1999. The Rajshahi Division price is the average of prices in Bogra, Dinajpur, Naogaon, Rangpur and Rajshahi districts. Excess cost of procurement is calculated as the excess procurement price times the quantity of procurement.

Source: Dorosh and Shahabuddin (1999).

price as a base, procurement raised market prices by an estimated 10.5 percent.¹⁰

As observed earlier, the procurement price set in boro season has been excessively high in recent period, resulting in extra costs to the government and windfall profits to those who are fortunate enough to sell at the procurement centres. Table 3.3 compares the procurement price to the market price of rice from 1996 to 1999 in the major boro procurement zone (Rajshahi) to assess whether it would have been possible to

¹⁰ The calculations described above involve important assumptions regarding spatial market integration and private stock behaviour. In this simple calculation, it is assumed that markets are integrated for the entire period of analysis and that there are no reverse flows in rice from urban to rural areas. Several studies provide econometric evidence suggesting that the wholesale markets for rice are in fact well integrated and therefore, the assumption that rural and urban markets are linked together throughout the year seems reasonable. Private stock behaviour, however, is much more difficult to take into account. A full model of private stock behaviour would require specifications of price expectations and storage costs of the private sector (Dorosh and Shahabuddin, 1999).

procure rice at a lower cost in these years. As shown in Table 3.3, the procurement price ranged from 0.27 to 1.88 Tk./kg above the May-July average Rajshahi wholesale price of coarse rice from 1996 through 1999. However, adjustments need to be made both for rice quality and location.¹¹

Thus, although the difference between the wholesale market price and the procurement price was only 0.27 Tk./kg in 1999, the government procured 602 thousand metric tons following the boro harvest. If we use this margin of 0.27 Tk/kg as the quality and transport factor needed to make wholesale market prices in Rajshahi Division comparable to the government procurement price, then the prices paid to farmers in 1996, 1997 and 1998 were excessive by 0.54, 1.61 and 0.08 Tk./kg, respectively (Estimate II of the excess procurement price). Multiplying by the procurement quantities in these years, the estimated excess cost of procurement was 226 million Taka in 1996, 391 million Taka in 1997, and 25 million Taka in 1999. Thus, in principle, the government could have met its objective of procuring rice for security stocks and public distribution at far lower costs. And given that few farmers actually participate in procurement, the vast majority of farmers would have had the same benefits as under fixed-price procurement (Dorosh and Shahabuddin, 1999).

As mentioned earlier, the government also intervenes in the foodgrain market through Open Market Sales (OMS) to contain upswings in rice prices. Open Market Sales of rice face a similar problem, as in the case of domestic procurement, in that no sales are possible when the OMS price is set above the market price. However, since the OMS price can easily be changed, the government is able to increase sales when needed

¹¹ For example, since government procurement standards are higher than the average quality of coarse rice, a quality adjustment of perhaps 0.5 to 1.5 Tk./kg should be added to the market price of rice. On the other hand, procurement generally takes place at LSDs in rural areas and so the costs of handling and transport must be added, in the range of 0.5 to 1.0 Tk./kg. The net adjustment may be rather small and depends on the location of the LSD and the wholesale market (Dorosh and Shahabuddin, 1999).

for stock rotation purposes simply by reducing the price. There have been numerous occasions when the OMS price was below the market price, (Figure 3.2) indicating that the OMS price has not served as a ceiling price, since the quantity of OMS sales in these periods has not been sufficient to reduce market prices to the OMS price level (Dorosh and Shahabuddin, 1999).

We have till now have been concerned with the temporal variation in prices in the rice market. But spatial price relationship should not be overlooked. Ahmed and Bernard (1989) carried out an analysis of market integration, which shows that although transmission of prices does occur to some degree in all markets at certain times in specific locations, the integration of markets is not complete. Even though Baulch, Das, et. al. (1996) later found that wholesale markets were generally well-integrated, special attention still should be given to those markets that are not well linked to the overall rice economy, and procurement and open market sales procedures should be adjusted accordingly. Since most of the markets showing poor integration are located in areas with underdeveloped infrastructure facilities, a long run solution to the problem lies in the development of infrastructure in the northern and southern parts of Bangladesh. This would strengthen integration of markets, and also improve the effectiveness of price stabilization efforts through the Public Food Distribution System (PFDS) in Bangladesh (Shahabuddin, 1996).

4. COSTS AND BENEFITS OF THE PFDS AND ALTERNATIVE STOCK OPTIONS

The previous chapter examined the extent to which the PFDS has stabilized prices in recent years. Price stabilization is only one of the objectives of the PFDS, however. The PFDS also serves as a mechanism of increasing access to food by poor households, as well as a means to provide relief to households affected by natural disasters.

Estimating the actual value of the PFDS to producers and consumers requires an accounting system based on market prices, not on financial prices of the GOB. Market prices change throughout the year, however, affecting the value of procurement and distribution, as well as the value of stocks. Valuing stocks, procurement and distribution and market prices each month permits an analysis of the direct costs and benefits (apart from the effects on price stabilization) of the PFDS (Table 4.1).

For example, in 2000/01, 900 thousand MTs of rice procurement are budgeted at a total cost of 1325 crore Taka. The average cost of domestically procured rice is thus 14.71 Tk/kg. Given an average market price of rice of 11.50 Tk/kg during the procurement months, the market value of the procured quantity was 1017 crore Taka. Thus, the subsidy on domestic rice procurement was 315 crore Taka, (about 54 million dollars). Government commercial imports are assumed to be procured at market prices. Thus, there is no subsidy on government commercial imports. The market value of imported food aid is calculated as the per unit cost of government commercial imports times the quantity of food aid. Note that food aid has a negotiated book price higher than the market price of commercial imports.

Table 4.1 — PFDS Financial Costs, 2000/01p (Crore Taka)

	Rice	Wheat	Total
OUTLAY			
Domestic Procurement	1158	267	1425
Food Aid	59	541	600
Commercial Imports	0	0	0
Marketing and Establishment Costs	179	164	343
Total Outlay	1396	972	2368
RECEIPTS			
Ration Channels	41	67	109
Food For Work	415	460	874
Change in Value of Stock	-20	-172	-191
Total Net Outlay	959	617	1577
Subsidy on Sales Channels	160	123	283
Intra-GOB Transfers (Non-Sales, Non-FFW)	800	494	1294

Table 4.2 — Decomposition of PFDS Net Outlay, 2000/01p (Crore Taka)

	Rice		Wheat		Total	
Total Net Outlay		959		617		1577
Producer subsidy (at market prices)	275	28.6%	60	9.7%	335	21.2%
Excess book value of food aid*	8	0.8%	117	19.0%	125	7.9%
Excess marketing costs	37	3.8%	33	5.3%	69	4.4%
Consumer subsidy (at market prices)	533	55.6%	356	57.7%	890	56.4%
Sales Channels	99	10.4%	79	12.9%	179	11.3%
Non-Sales, Non-FFW	559	58.2%	382	61.9%	941	59.7%
FFW**	-125	-13.0%	-105	-17.0%	-230	-14.6%
Change in stock quality and value***	107	11.1%	51	8.3%	158	10.0%
Total	959	100.0%	617	100.0%	1577	100.0%

Notes: * Difference between book value of food aid and estimated market value of commercial imports.

** Negative values for FFW indicate that the market price is below the intra-GOB transfer price.

*** Change in value of stock due to price and quality effects.

The value of foodgrain to consumers is calculated using the market price in the month in which the foodgrain is distributed. Moreover, rice in excess of xx months old and wheat in excess of yy months old is assumed to have a market value equal to only 85 percent of the market price of new foodgrain.¹²

Using this framework, the total net outlay of the PFDS can be decomposed to show benefits and losses (Table 4.2).¹³ The consumer subsidy, calculated as the difference between the market price of food and the sales price to consumers multiplied by the quantity distributed, is the largest component of the PFDS, accounting for 56.4 percent of net outlay in 2000/01. The producer subsidy (335 crore Taka, of which 275 crore Taka was for domestic rice procurement), accounts for 21.2 percent of total net outlays. Changes in the value of stock due to price effects and quality adjustments represent 10.0 percent of net outlays. The remaining 12.4 percent of net outlays is due to excess valuation of food aid and higher marketing costs of the PFDS in comparison with the private sector.

Implicit losses to rice consumers of quality deterioration were significant in 2000/01: 107 crore Taka (about 19 million dollars), equal to 11.1 percent of total net outlay on rice of the PFDS. Avoiding quality losses requires either increased shelf life or quicker stock rotation (through distribution or some form of open market sales).

¹² Assuming that foodgrain stocks are rotated on a first-in first-out basis, the amount of stock at the end of period t that is age x months or greater, can be calculated as the end stock level at time tx and subtracting total distribution from period $t-x+1$ through period t . This figure represents the minimum amount of stock of age x months. If stock is not rotated on a first-in first-out basis, then the amount of old stock could be larger.

¹³ This report makes no attempt to estimate who actually receives the producer and consumer subsidies. Shahabuddin (1999) provides evidence that few small farmers participate in boro procurement; studies by del Ninno (2000) and Ahmed (1999) have suggested that in past years, there have been substantial leakages in foodgrain distribution, as well.

ANALYSIS OF ALTERNATIVE PFDS STOCK OPTIONS

The framework outlined in the previous section can facilitate an analysis of the benefits and costs of alternative stock policies. Because quality of foodgrain is an important aspect of policy and the GOB currently has no mechanism to rotate stocks apart from PFDS distribution, the level of stocks is closely related to the size of the PFDS. Thus, in this section, we analyze various combinations of stock and distribution levels, estimating financial costs to the government and overall benefits to producers and consumers, (ignoring the possible effects on market price stabilization).

The base scenario is designed to approximate the size of the PFDS in 2000/01, with starting and ending net stocks of rice and wheat each equal to 400 thousand MTs, and with total distribution of 1.8 million MTs, (850 thousand MTs of rice and 950 thousand MTs of wheat). Month-by-month procurement and distribution in the base scenario reflect typical timing and levels of actual procurement and distribution, (Tables 4.3 and 4.4). With near-ideal stock management, only 58 thousand MTs of rice more than 7 months old is distributed in the base scenario. No wheat more than 8 months old is distributed.

If stock is increased to 1.0 million MTs, but distribution is unchanged (Option 1), the amount of old stock distributed increases to 336 thousand MTs of rice and 170 thousand MTs of wheat, though net outlay is essentially unaffected. Thus, quality loss as a percentage of net outlay rises from 0.9 percent in the base to 6.9 percent in Option 1.

In order to avoid the problems of accumulation of old stock, distribution could be increased along with the target stock levels (Option 2). In this scenario, however, there is a large increase in net outlay of 162 crore Taka, as increased distribution is assumed to take place through non-sales channels. The marginal benefit to consumers (and

Table 4.3 — Monthly Projection of Govt. Stock, Procurement, Import, Offtake of Rice and Wheat during 2000/2001

Month	Net opening stock			Addition										Off-take						Net closing stock (net of stock-in-transit = 93,111 mt) (Rice 15216, Wheat 77895)			Estimated age of rice stock *					Estimated age of wheat stock *								
				Domestic Procurement			Imports			Total addition	Rice Distribution			Wheat Distribution			Total off-take	Month-end Rice Stock	Age more than 6 months				Age more than 7 months	Age more than 8 months	Age more than 9 months	Age more than 10 months	Month-end Wheat Stock	Age more than 6 months	Age more than 7 months	Age more than 8 months	Age more than 9 months					
	Rice	Wheat	Total	Rice	Wheat	Total	Rice	Wheat	Total		Rice	Wheat	Total	Priced/Ration	Non-Priced	Total				Priced/Ration	Non-Priced	Total														
Jul	400.0	400.0	800.0	105.0	0.0	105.0	0.0	25.0	0.0	0.0	0.0	25.0	25.0	130.0	11.0	38.0	49.0	12.0	36.0	48.0	97.0	455.0	376.0	831.0	455.0	0	0	0	0	0	376.0	0	0	0	0	
Aug	455.0	376.0	831.0	50.0	0.0	50.0	0.0	50.0	0.0	0.0	0.0	50.0	50.0	100.0	11.0	38.0	49.0	12.0	36.5	48.5	97.5	455.0	376.5	831.5	455.0	5	0	0	0	0	376.5	0	0	0	0	
Sep	455.0	376.5	831.5	0.0	0.0	0.0	0.0	50.0	0.0	0.0	0.0	50.0	50.0	50.0	11.0	39.0	50.0	13.0	36.0	49.0	99.0	404.0	376.5	780.5	404.0	0	0	0	0	0	376.5	0	0	0	0	
Oct	404.0	376.5	780.5	0.0	0.0	0.0	0.0	75.0	0.0	50.0	0.0	125.0	125.0	125.0	11.0	41.0	52.0	14.0	36.0	50.0	102.0	351.0	450.5	801.5	351.0	0	0	0	0	0	450.5	108	0	0	0	
Nov	351.0	450.5	801.5	0.0	0.0	0.0	0.0	75.0	0.0	50.0	0.0	125.0	125.0	125.0	11.0	25.0	36.0	14.0	56.0	70.0	106.0	314.0	503.5	817.5	314.0	0	0	0	0	0	503.5	156	36	0	0	
Dec	314.0	503.5	817.5	75.0	0.0	75.0	0.0	75.0	0.0	0.0	0.0	75.0	75.0	150.0	11.0	36.0	47.0	15.0	72.5	87.5	134.5	341.0	489.0	830.0	341.0	0	0	0	0	0	489.0	117	67	0	0	
Jan	341.0	489.0	830.0	200.0	0.0	200.0	0.0	50.0	0.0	0.0	0.0	50.0	50.0	250.0	11.1	72.0	83.1	15.0	52.0	67.0	150.1	456.9	470.0	926.9	456.9	147	42	0	0	0	470.0	73	48	0	0	
Feb	456.9	470.0	926.9	125.0	0.0	125.0	0.0	50.0	0.0	0.0	0.0	50.0	50.0	175.0	11.3	117.0	128.3	14.0	67.0	81.0	209.3	452.6	437.0	889.6	452.6	68	18	0	0	0	437.0	40	0	0	0	
Mar	452.6	437.0	889.6	0.0	0.0	0.0	0.0	50.0	0.0	0.0	0.0	50.0	50.0	50.0	11.5	115.0	126.5	11.0	92.0	103.0	229.5	325.1	382.0	707.1	325.1	0	0	0	0	0	382.0	0	0	0	0	
Apr	325.1	382.0	707.1	25.0	150.0	175.0	0.0	50.0	0.0	0.0	0.0	50.0	50.0	225.0	11.7	99.0	110.7	10.0	97.0	107.0	217.7	237.4	473.0	710.4	237.4	0	0	0	0	0	473.0	1	0	0	0	
May	237.4	473.0	710.4	110.0	120.0	230.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	230.0	11.7	70.0	81.7	10.0	97.0	107.0	188.7	263.7	484.0	747.7	263.7	0	0	0	0	0	484.0	17	0	0	0	
Jun	263.7	484.0	747.7	175.0	50.0	225.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	225.0	11.7	25.0	36.7	10.0	122.0	132.0	168.7	400.0	400.0	800.0	400.0	0	0	0	0	0	400.0	0	0	0	0	
Total				865.0	320.0	1185.0	0.0	550.0	0.0	100.0	0.0	650.0	650.0	1835.0	135.0	715.0	850.0	150.0	800.0	950.0	1800.0															

* The figures show the lowest possible quality of stock of each respective age.

Month	Opening Stock (Gross)			Off-Take																							Total Off-take (Gross)									
				Rice											Wheat																					
	Total Addition	Priced			Non-Priced								Rice Total	Priced			Non-Priced								Wheat Total											
O/S /FPC		OP	EP	Total	FFW	VGD	FFE	TR	VGF	GR	Other	Total		O/S /FPC	OP /FM	LEI	EP	Total	FFW	VGD	FFE	TR	VGF	GR		Other	Total									
Jul	415.2	477.9	893.1	130.0	0.0	0.8	10.0	11.0	0.0	16.0	0.0	0.0	20.0	1.0	1.0	38.0	49.0	2.0	1.0	1.0	8.0	12.0	5.0	0.0	30.0	0.0	0.0	0.0	1.0	36.0	48.0	97.0	470.2	453.9	924.1	
Aug	470.2	453.9	924.1	100.0	0.0	0.8	10.0	11.0	0.0	16.0	0.0	0.0	20.0	1.0	1.0	38.0	49.0	2.0	1.0	1.0	8.0	12.0	5.0	0.0	30.0	0.0	0.0	0.0	1.5	36.5	48.5	97.5	470.2	454.4	924.6	
Sep	470.2	454.4	924.6	50.0	0.0	0.8	10.0	11.0	0.0	16.0	0.0	0.0	20.0	1.0	2.0	39.0	50.0	3.0	1.0	1.0	8.0	13.0	5.0	0.0	30.0	0.0	0.0	0.0	1.0	36.0	49.0	99.0	419.2	454.4	873.6	
Oct	419.2	454.4	873.6	125.0	0.0	0.8	10.0	11.0	0.0	16.0	0.0	0.0	20.0	1.0	4.0	41.0	52.0	4.0	1.0	1.0	8.0	14.0	5.0	0.0	30.0	0.0	0.0	0.0	1.0	36.0	50.0	102.0	366.2	528.4	894.6	
Nov	366.2	528.4	894.6	125.0	0.0	0.8	10.0	11.0	0.0	0.0	0.0	0.0	20.0	1.0	4.0	25.0	36.0	4.0	1.0	1.0	8.0	14.0	10.0	15.0	30.0	0.0	0.0	0.0	1.0	56.0	70.0	106.0	329.2	581.4	910.6	
Dec	329.2	581.4	910.6	150.0	0.0	0.8	10.0	11.0	2.0	0.0	0.0	5.0	20.0	5.0	4.0	36.0	47.0	5.0	1.0	1.0	8.0	15.0	20.0	15.0	30.0	5.0	1.0	0.0	1.5	72.5	87.5	134.5	356.2	566.9	923.1	
Jan	356.2	566.9	923.1	250.0	0.0	0.8	10.5	11.1	10.0	0.0	28.0	5.0	20.0	5.0	4.0	72.0	83.1	5.0	1.0	1.0	8.0	15.0	30.0	15.0	0.0	5.0	1.0	0.0	1.0	52.0	67.0	150.1	472.1	547.9	1020.0	
Feb	472.1	547.9	1020.0	175.0	0.0	0.8	10.5	11.3	60.0	0.0	28.0	5.0	15.0	5.0	4.0	117.0	128.3	4.0	1.0	1.0	8.0	14.0	40.0	15.0	0.0	10.0	1.0	0.0	1.0	67.0	81.0	209.3	467.8	514.9	982.7	
Mar	467.8	514.9	982.7	50.0	0.0	0.8	11.0	11.5	60.0	0.0	28.0	10.0	10.0	3.0	4.0	115.0	126.5	1.0	1.0	1.0	8.0	11.0	60.0	15.0	0.0	15.0	0.0	1.0	92.0	103.0	229.5	340.3	459.9	800.2		
Apr	340.3	459.9	800.2	225.0	0.0	0.8	11.0	11.7	50.0	0.0	28.0	10.0	5.0	2.0	4.0	99.0	110.7	0.0	1.0	1.0	8.0	10.0	65.0	15.0	0.0	15.0	1.0	0.0	1.0	97.0	107.0	217.7	252.6	550.9	803.5	
May	252.6	550.9	803.5	230.0	0.0	1.0	11.0	11.7	35.0	0.0	28.0	5.0	0.0	0.0	2.0	70.0	81.7	0.0	1.0	1.0	8.0	10.0	75.0	15.0	0.0	5.0	1.0	0.0	1.0	97.0	107.0	188.7	278.9	561.9	840.8	
Jun	278.9	561.9	840.8	225.0	0.0	1.0	11.0	11.7	23.0	0.0	0.0	0.0	0.0	0.0	2.0	25.0	36.7	0.0	1.0	1.0	8.0	10.0	70.0	15.0	30.0	5.0	1.0	0.0	1.0	122.0	132.0	168.7	415.2	477.9	893.1	
Total				1835.0	0.0	10.0	125.0	135.0	240.0	64.0	140.0	40.0	170.0	25.0	36.0	715.0	850.0	30.0	12.0	12.0	96.0	150.0	390.0	120.0	210.0	60.0	7.0	0.0	13.0	800.0	950.0	1800.0				

Table 4.4a — PFDS Subsidies (Rice), Base Scenario, (FY 2000/2001 Prices)

	PFDS			Market value total			Market value Q1			Market value Q2			Subsidy/ Transfer (crore Tk)
	Quantity (000 MT)	Price (Tk/Kg)	Value (crore Tk)	Quantity (000 MT)	Price (Tk/Kg)	Value (crore Tk)	Quantity (000 MT)	Price (Tk/Kg)	Value (crore Tk)	Quantity (000 MT)	Price (Tk/Kg)	Value (crore Tk)	
Sources of Foodgrain													
Opening Stock (at previous year's end price)	415	14.75	612	415	12.09	502	415	12.09	502	0	10.41	0	110
Opening Stock (at current year's end price)	415	14.43	599	415	11.95	496	415	11.95	496	0	9.69	0	103
Change in Value of Opening Stock			-13			-6			-6			0	-7
Domestic Rice Procurement	865	12.75	1103	865	10.39	899	865	10.39	899				205
Marketing, Management Cost (Domestic)	865	1.24	107	865	1.56	135	865	1.56	135				-28
Food Aid Rice Imports	0	0.00	0	0	0.00	0	0	0.00	0				0
Marketing, Management Cost (Food Aid)	0	1.24	0	0	0.00	0	0	1.24	0				0
Government Commercial Rice Imports	0	0.00	0	0	0.00	0	0	0.00	0				0
Marketing, Management Cost (Imports)	0	1.24	0	0	0.00	0	0	1.24	0				0
Fixed Costs per Unit of Procurement	865	0.44	38										38
Total Cost of Procurement	865	14.43	1248	865	11.95	1033	865	11.95	1033				215
Uses of Foodgrain													
Rice Distribution	850	4.56	387	850	11.79	1002	792	11.95	946	58	9.69	56	-615
Sales Channels	135	3.03	41	135	11.79	159	126	11.95	150	9	9.69	9	-118
Non-Sales, Non-FFW (MOF receipts)	475	14.43	685										
Non-Sales, Non-FFW (GOB receipts)	475	0.00	0	475	11.79	560	443	11.95	529	32	9.69	31	-560
FFW	240	14.43	346	240	11.79	283	224	11.95	267	16	9.69	16	63
Official Storage Losses	15	14.43	22	15	11.71	18	13	11.95	16	2	10.15	2	4
End Stock (at current year's end price)	415	14.43	599	415	11.95	496	415	11.95	496	0	10.15	0	103
Consumer Subsidy on Rice			839										839
Official PFDS Subsidy (sales channels only)			154										

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Table 4.4b — PFDS Subsidies (Wheat), Base Scenario, (FY 2000/2001 Prices)

	PFDS			Market value total			Market value Q1			Market value Q2			Subsidy Value /Transfer (crore Tk)
	Quantity (000MT)	Price (Tk/Kg)	Value	Quantity (000MT)	Price (Tk/Kg)	Value	Quantity (000MT)	Price (Tk/Kg)	Value	Quantity (000MT)	Price (Tk/Kg)	Value	
			(crore Tk)			(crore Tk)			(crore Tk)				
Sources of Foodgrain													
Opening Stock (at previous year's end Price)	478	11.15	533	478	8.49	406	478	8.49	406	0	7.22	0	127
Opening Stock (at current year's end Price)	478	11.68	558	478	9.41	450	478	9.41	450	0	8.00	0	108
Change in Value of Opening Stock			25			44			44			0	-19
Domestic Wheat Procurement	320	8.90	285	320	6.86	220	320	6.86	220				65
Marketing, Management Cost (Domestic)	320	1.17	37	320	1.03	33	320	1.03	33				4
Food Aid Wheat Imports	550	10.16	559	550	8.25	454	550	8.25	454				105
Marketing, Management Cost (Food Aid)	550	1.90	105	550	1.90	105	550	1.90	105				0
Government Commercial Wheat Imports	100	8.25	83	100	8.25	83	100	8.25	83				0
Marketing, Management Cost (Imports)	100	1.90	19	100	1.90	19	100	1.90	19				0
Fixed Costs per Unit of Procurement	970	0.47	45										45
Total Cost of Procurement	970	11.68	1133	970	9.41	912	970	9.41	912				220
Uses of Foodgrain													
Wheat Distribution	950	5.43	516	950	9.41	894	950	9.41	894	0	8.00	0	-378
Sales Channels	150	4.03	60	150	9.41	141	150	9.41	141	0	8.00	0	-81
Non-Sales, Non-FFW (MOF receipts)	410	11.68	479										
Non-Sales, Non-FFW (GOB receipts)	410	0.00	0	410	9.41	386	410	9.41	386	0	8.00	0	-386
FFW	390	11.68	455	390	9.41	367	390	9.41	367	0	8.00	0	89
Official Storage Losses	20	11.68	23	20	9.41	19	20	9.41	19	0	8.00	0	5
End Stock (at current year's end Price)	478	11.68	558	478	9.41	450	478	9.41	450	0	8.00	0	108
Consumer Subsidy on Wheat			593										593
Official PFDS Subsidy (sales channels only)			115										

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producers) is rather small, however, (only 44 crore Taka) and the marginal benefit/cost ratio is only 0.27.

Reducing stock to 0.7 million MTs and keeping distribution at 1.8 million MTs, (the level of distribution in the base scenario), has very little effect on marginal outlay, but results in a minimum rice stock level of only 202 thousand MTs at its lowest point during the year (Option 3).

Finally, under Option 4, distribution of rice is increased by 50 thousand MTs relative to the base, and wheat stocks are increased by 50 thousand MTs while rice stocks are reduced by 50 thousand MTs. As a result of these changes, quality loss in the system is greatly reduced because no rice stock reaches 7 months of age. The marginal net outlay of 63 crore Taka produces 83 crore Taka of benefits.

Thus, costs and benefits of alternative stock targets are closely related to storage losses and the levels of distribution required to rotate stocks. Increasing the size of stock by moderate amounts, (e.g. 200 thousand MTs in Option 1), leads to only small net marginal outlays, but unless procurement and distribution are also raised, the quality of the stock for distribution deteriorates.

5. CONCLUSIONS AND POLICY IMPLICATIONS

Price stabilization is an important policy objective of the government of Bangladesh. However, procurement prices and OMS prices are not true floor and ceiling prices, since there is no attempt to buy all the foodgrains offered at the procurement price nor sell unlimited quantities of foodgrains at the OMS price. Operationally, therefore, the overriding policy objective has been ensuring the smooth operation of the Public Food Distribution System, which has been increasingly targeted to the poor, particularly with the elimination of Statutory Rationing and Rural Rationing channels in the early 1990s.

The reduction in the size of the PFDS in the early 1990s diminished the government's share of total foodgrain sales and consumption, and to some extent its influence on domestic market prices. The trade liberalization of the early 1990s also reduced government control on the supply of foodgrains through imports, though it opened the possibility that private sector imports could stabilize markets in times of domestic production shortfalls, perhaps in a cost effective way. In fact, with trade liberalization, private sector imports have added to price stability by effectively providing a price ceiling at import parity following poor harvests in 1994/95, 1997/98 and more recently in 1998/99. Nevertheless, stability of rice prices remains a concern; especially since export parity does not provide an effective floor because export contracts have not been established.

The domestic procurement program, therefore, has retained its importance. A recent survey, however, has shown that the farmers' participation in the program has been disappointingly low (only 10 percent). There are other problems associated with the implementation of the program as well. Production instability in the aman season makes

price forecasting difficult. In five of the last six years, the eventual average wholesale market price at harvest was above the procurement price, resulting in, on an average, of only 8.9 percent of the procurement target being actually achieved. Moreover, the procurement price set in the boro season has been excessively high in 3 out of 4 recent years, resulting in extra costs to the government and windfall profits to those who are fortunate enough to sell at the procurement centres. Procurement prices substantially above market prices increase the potential for rent-seeking behaviour and corruption of public officials connected with procurement.¹⁴ Open tendering has succeeded in including some domestic procurement following unexpected domestic production shortfalls in 1998 and 1999. Technical problems remain, but if these are overcome, costs could be reduced and reliability of procurement could be increased.

It may be emphasized here that although stabilization of prices constitutes an important element of production incentives and consumer welfare, price stabilization especially containing upswings in prices, is also important politically. High prices in Bangladesh are treated as a crisis situation and are often interpreted by critics as a failure of the government to ensure food security. As such high prices point to the need of the government to intervene, even though this intervention can sometimes be very costly and ineffective. Typically, in Bangladesh high rice prices set in motion a pressure for high public stock without attention to the fact that high stocks are no guarantee that the food security of the poor is properly addressed.

FOODGRAIN STOCKS

Foodgrain stocks serve dual purposes: they provide working stocks for routine distribution and they also serve as security stocks for emergency distribution. However,

¹⁴ In fact, the fixation of procurement price at an appropriate level is critical for (a) providing incentives to producers (b) allowing maximum scope for operation of private traders, and (c) preventing excessive destabilizing impact on either the budget or the financial market (Ahmed et. al. 1991).

increases in stock levels imply either increased distribution or quality losses. The direct costs of increased distribution are clearly shown in the government accounts. The costs to consumers of quality deterioration of PFDS foodgrain are not accounted for, however. Closer attention to the quality of foodgrain in storage, and the tight link between size of stocks and the amount of distribution needed to rotate stocks is needed. Thus, decisions on procurement need to be taken in light of the potential costs of increased distribution and quality deterioration of stocks.

The analysis shows that current stock levels are broadly consistent with the current level of PFDS distribution, given available stock rotation options. Holding higher stocks and keeping distribution constant would entail substantial quality losses, unless alternative means of rotating stocks (e.g. through sales and purchases at open market prices at the wholesale levels) are adopted. Holding lower stocks would result in minimum stock levels falling below currently perceived "safe" levels for emergency distribution needs. Small changes in the stock levels, however, have relatively small effects on the costs and benefits of the PFDS. Maintaining good quality storage, effective stock management and minimizing leakages are more important determinants of the overall PFDS financial efficiency.

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