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**TRADE LIBERALIZATION  
AND  
FOOD SECURITY IN BANGLADESH:  
  
THE ROLE  
OF  
PRIVATE SECTOR IMPORTS**

**PAUL A. DOROSH**

**OCTOBER 1999**

*FMRSP Working Paper No. 16*

**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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*This work was funded by the United States Agency for International Development (USAID)*

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## TABLE OF CONTENTS

<b>ACKNOWLEDGEMENTS .....</b>	<b>i</b>
<b>LIST OF TABLES .....</b>	<b>iii</b>
<b>LIST OF MAP AND FIGURES .....</b>	<b>iii</b>
<b>EXECUTIVE SUMMARY .....</b>	<b>iv</b>
<b>1. INTRODUCTION .....</b>	<b>1</b>
<b>2. THE RICE ECONOMIES OF BANGLADESH AND INDIA.....</b>	<b>3</b>
RICE PRODUCTION, MARKETS AND CONSUMPTION.....	3
GOVERNMENT POLICY AND PUBLIC FOODGRAIN DISTRIBUTION .....	7
RICE TRADE BY BANGLADESH AND INDIA .....	11
<b>3. PRIVATE SECTOR RICE TRADE BETWEEN INDIA AND BANGLADESH.....</b>	<b>18</b>
PRODUCTION SHORTFALLS AND BANGLADESH RICE IMPORTS FROM INDIA.....	18
<i>The 1997/98 Aman Rice Shortfall in Bangladesh.....</i>	<i>19</i>
<i>Rice Imports After the 1998 Bangladesh Flood.....</i>	<i>21</i>
ALTERNATE ESTIMATES OF THE VOLUME OF RICE TRADE .....	22
<i>Comparisons of Import and Export Data.....</i>	<i>22</i>
<i>Rice Availability and Market Prices in Bangladesh.....</i>	<i>25</i>
<b>4. PRIVATE IMPORTS AND FOOD SECURITY: IMPLICATIONS OF TRADE WITH INDIA.....</b>	<b>33</b>
MARKET PRICES IN THE ABSENCE OF PRIVATE SECTOR TRADE.....	33
COMPETITIVENESS OF THE PRIVATE SECTOR IMPORT TRADE IN BANGLADESH .....	34
THE RELIABILITY OF THE INDIAN RICE MARKET.....	35
<b>5. IMPLICATIONS FOR BANGLADESH FOOD POLICY .....</b>	<b>41</b>
<b>REFERENCES.....</b>	<b>45</b>

## LIST OF TABLES

Table 2.1 — The Bangladesh and India Rice Economies, 1997/98 .....	4
Table 2.2 — Rice Area, Yield and Production in India by State and Season (Average 1992/93 - 1994/95).....	5
Table 2.3 — Public Foodgrain Distribution in Bangladesh, 1988/89 - 1998/99 .....	9
Table 2.4 — Rice Production, Trade and Stock Changes in India, 1980/81 -1997/98.....	12
Table 2.5 — India Total Rice Exports, 1992/93 - 1998/99 .....	13
Table 2.6 — Estimated Volume of India's Non-basmati Rice Exports by Destination, 1992/93 - 1998/99 .....	14
Table 2.7 — Bangladesh Foodgrain Trade, 1980/81 - 1998/99 .....	16
Table 2.8 — Bangladesh Rice Imports by Source, 1994/95 - 1997/98 .....	17
Table 3.1 — Comparison of Bangladesh Rice Import and India Rice Export Data, 1994/95 - 1998/99 .....	23
Table 3.2 — Bangladesh Total Imports from India, 1997/98.....	26
Table 3.3 — Estimated Rice Demand and Implicit Private Stock Change, 1996/97-1998/99 .....	27
Table 3.4 — Implicit Private Stock Changes under Alternative Assumptions for Own- Price Elasticity of Rice Demand .....	31
Table 4.1 — Total Production of Aman and Kharif Rice In Bangladesh and India and Percentage Deviation from Trend, 1981-99 .....	37
Appendix Table 2.1 — Value of India's Non-Basmati Rice Exports by Destination, 1992/93 - 1998/99 .....	44

## LIST OF MAP AND FIGURES

Map 2.1 — Major Rice Producing States in India.....	6
Figure 3.1 — Rice Prices and Quantity of Private Imports in Bangladesh, 1993-99 .....	20
Figure 3.2 — Effects of a Production Shortfall .....	30
Figure 4.1 — Total Production of Rice in Bangladesh and India, 1972-99 (Percentage Deviation from Trend) .....	38
Figure 4.2 — Total Production of Aman Rice in Bangladesh and Kharif Rice in India, 1989-99 (Percentage Deviation from Trend).....	39

## EXECUTIVE SUMMARY

Following a poor harvest in late 1997 and a massive flood in 1998, private sector traders in Bangladesh imported several million metric tons of rice from India. This paper presents evidence that this trade, made possible by separate trade liberalizations in India and Bangladesh in the early 1990s, augmented domestic supplies and stabilized prices in Bangladesh at import parity levels. Letters of credit data indicating the participation of hundreds of importers, and a close correlation of price movements across the two countries suggest that the trade is competitive. A risk of co-incident crop shortfalls in the two countries remains, though these have occurred rarely in the past two decades. Bangladesh imports from alternative sources would also enhance food availability if another production shortfall occurs, but these imports face higher transport costs and would involve far fewer importing firms given the economies of scale of shipments by sea.

The positive contribution of trade liberalization to short-run food security in Bangladesh in recent years does not minimize the importance of increased agricultural productivity and rural economic growth to provide rural poor households with sufficient incomes to acquire food. Nonetheless, the Bangladesh experience shows that trade liberalization offers potential benefits for national food security by enabling a rapid increase of food supplies following domestic production shortfalls.

## 1. INTRODUCTION

For more than five decades, the governments of South Asian countries have intervened heavily in food markets. Spurred by a determination to prevent a major famine like the Great Bengal famine of 1943, both India and Pakistan (and later Bangladesh) continued various forms of state procurement, storage and distribution of food grains (mainly rice and wheat), (Tyagi, 1990; Ahmed, Haggblade and Chowdhury, forthcoming). Broad trade liberalization in India and Bangladesh in the early 1990s, that included allowing private traders to import and export food grain (though still with some restrictions), have added an important new dimension to food policy and food security in Bangladesh, however.

Following major rice production shortfalls in Bangladesh in late 1997 and again in late 1998, private sector traders imported several million metric tons of rice from India. This paper presents evidence that this trade augmented domestic supplies and stabilized prices in Bangladesh. Nonetheless, in spite of the positive contribution of trade liberalization to short-run food security in Bangladesh in recent years, widespread concerns remain regarding possible adverse affects on long-term food security. In particular, can the private sector and international markets be relied on as a source of food grain? More broadly, what are the implications of trade liberalization for public sector price stabilization and food distribution?

A substantial theoretical and modeling literature exists on the issue of price stabilization. Economic theory suggests that unless risk aversion is very high, there are only minimal benefits of price stabilization for food producers and consumers, as measured in terms of consumer and producer surplus (Turnovsky, Shalit and Schmitz, 1980; Newbery and Stiglitz, 1981). Timmer (1989) nonetheless argues that other considerations, such as the contribution of food price stability to increased household

investment in productive activities rather than in stockholding, are major benefits of price stabilization. Moreover, political considerations including the perceived risk of food shortages in major urban centers, lead many governments to attempt to stabilize food prices and operate public food distribution programs, with varying degrees of success, (Islam and Thomas, 1996). Finally, both theory and empirical modeling suggest that setting floor and ceiling prices near export and import parity and relying on international trade can reduce the need for large government stocks and reduce costs (Pinckney, 1988; Goletti, 1994).

Section two of this paper presents an overview of the rice economies of Bangladesh and India, comparing production patterns and the role of the public sector in rice markets. Trade policy reforms and changes in the level of trade flows are also highlighted. Section three describes the surges in cross-border trade of rice between India and Bangladesh following recent production shortfalls in Bangladesh. This section also discusses the uncertainty regarding the volume of the rice trade, examining the discrepancy between Indian export and Bangladesh import data and providing estimates of Bangladesh net availability and consumer demand for rice. The fourth section explores issues of long-term food security and the reliability of the Indian market as a source of rice supply for Bangladesh. The final section summarizes and discusses the implications for Bangladesh food policy.

## 2. THE RICE ECONOMIES OF BANGLADESH AND INDIA

The rice economy of Bangladesh shares much in common with that of India, particularly the eastern states of West Bengal, Bihar, Orissa and Andhra Pradesh. These regions share the same colonial history, as well as similar agro-ecologies and crop technologies. Nonetheless, there are substantial differences between Bangladesh and India in terms of the overall importance of rice in food consumption, seasonal patterns of production, levels of public stocks, channels of public foodgrain distribution and trade policy. Together, these factors have heavily influenced the evolution of external trade in rice of the two countries.

### RICE PRODUCTION, MARKETS AND CONSUMPTION

No single foodgrain dominates India's food consumption as does rice in Bangladesh. Rice accounts for 72.8 percent of calories consumed in Bangladesh, but only 33.3 percent of calories consumed in India (Table 2.1). In India, wheat (20.4 percent) and other foodgrains (sorghum, millet and maize, 9.4 percent) are the major foodgrains in substantial regions of the country. Thus, on a national basis, though rice is the leading food in India in terms of calories consumed, annual rice consumption was only 83.9 kilograms per capita in 1997/98, only half of per capita rice consumption in Bangladesh. Nonetheless, given the nearly eight-fold difference in population between the two countries (966 million people in India compared with 125 million people in Bangladesh in 1996/97), total rice consumption in India is 4.3 times greater than in Bangladesh, and total wheat consumption is 21 times greater than in Bangladesh.

Nearly 90 percent of India's rice is produced in the kharif (aman) season (Table 2.1). Thus, during this season, India's production of rice is about 70 million metric tons (milled equivalent), nearly eight times that of Bangladesh (about 9 million tons).

Table 2.1 — The Bangladesh and India Rice Economies, 1997/98

	(1) Bangladesh	(2) India	(3) Difference (1) - (2)
Population (million)	125.0	966.2	-841.2
Rice Production ('000 MTs)	18,862	83,508	-64,646
Aman (Kharif) ('000 MTs)	8,850	72,500	-63,650
Boro/Aus (Rabi) ('000 MTs)	10,012	11,000	-988
Imports ('000 MTs)	1,203	33	1,170
Exports ('000 MTs)	0	5770	-5770
Net Imports ('000 MTs)	1,203	-5,737	6,940
Net Imports/Production (%)	6.4%	-6.9%	13.2%
Government Rice Stocks ('000 MTs)	350	12,883	-12,533
Government Rice Stocks/Production (%)	1.9%	15.4%	-13.6%
Rice Consumption (kg/cap/year)	152.3 <sup>a</sup>	83.9	68.4
Calorie Share (percentage)	72.8% <sup>a</sup>	33.3%	39.4%

Notes: <sup>a</sup> FAO Food Balance Sheet, 1997

Source: (1) Bangladesh data from, FPMU, 1999, except for rice consumption and calorie share.

(2) India data from FAO Food Balance Sheet, 1997, and CMIE, August 1998.

**Table 2.2 — Rice Area, Yield and Production in India by State and Season (Average 1992/93 - 1994/95)**

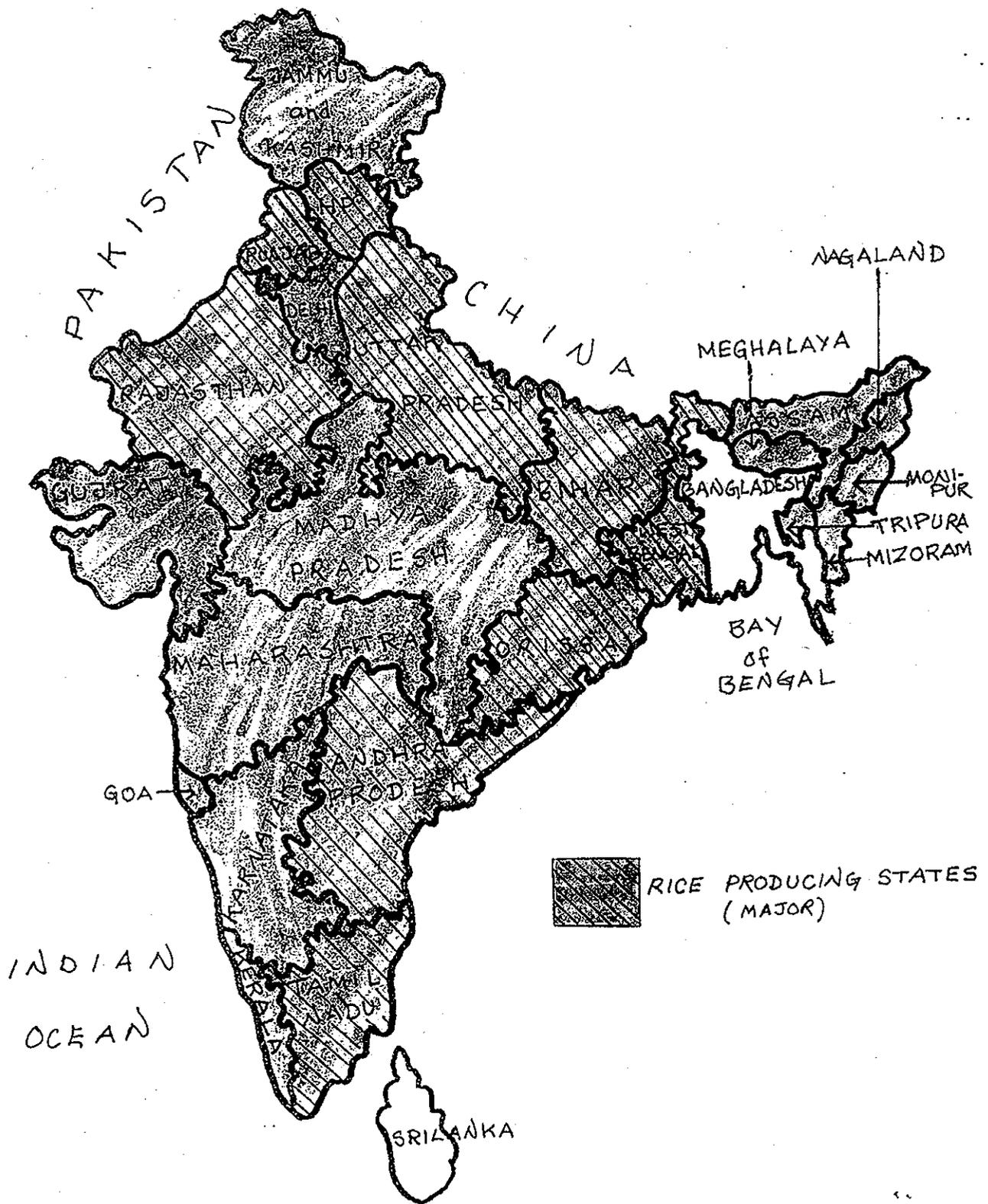
States	Production ('000 MTs)			Area ('000 Ha)			Yield Rate ( MT/Ha)		
	Kharif	Rabi	Total	Kharif	Rabi	Total	Kharif	Rabi	Total
Andra Pradesh	6288	2904	9192	2564	991	3554	2.45	2.93	2.59
Arunachal Pradesh	123		123	119		119	1.04	n.a.	1.04
Assam	3098	225	3323	2364	136	2500	1.31	1.66	1.33
Bihar	5111	195	5306	4553	101	4654	1.12	1.93	1.14
Gujrarat	870		870	595		595	1.46	n.a.	1.46
Haryana	2051		2051	750		750	2.73	n.a.	2.73
Himachal Pradesh	108		108	82		82	1.32	n.a.	1.32
Jammu & Kashmir	508		508	273		273	1.86	n.a.	1.86
Karnataka	2308	841	3148	1032	301	1333	2.24	2.79	2.36
Kerala	866	151	1017	447	69	516	1.94	2.19	1.97
Madhya Pradesh	5748		5748	5144		5144	1.12	n.a.	1.12
Maharashtra	2355	60	2415	1512	31	1544	1.56	1.91	1.56
Manipur	321		321	158		158	2.04	n.a.	2.04
Meghalaya	117		117	104		104	1.13	n.a.	1.13
Mizoram	85	9	94	60	3	64	1.42	2.45	1.47
Nagaland	177		177	135		135	1.31	n.a.	1.31
Orissa	5636	483	6119	4243	242	4485	1.33	2.00	1.36
Punjab	7449		7449	2174		2174	3.43	n.a.	3.43
Rajasthan	164		164	147		147	1.11	n.a.	1.11
Tamil Nadu	6099	981	7080	1955	321	2276	3.12	3.06	3.11
Tripura	378	97	475	202	51	252	1.87	1.92	1.88
Uttar Pradesh	10006	8	10014	5419	3	5422	1.85	2.43	1.85
West Bengal	8988	3019	12007	4798	984	5781	1.87	3.07	2.08
Others	268	14	282	120	6	125	2.24	2.39	2.24
All India	69122	8986	78108	38948	3238	42186	1.77	2.77	1.85
Border Sates <sup>a</sup>	12666	3350	16015	7527	1174	8701	1.68	2.85	1.84

Source: Directorate of Economics and Statistics, Department of Agriculture and Co-operation, MOA, GOI.

Notes: n.a. indicates not available.

<sup>a</sup> States bordering Bangladesh : West Bengal, Assam, Meghalaya, Mizoram and Tripura.

Map 2.1 — Major Rice Producing States in India



In contrast, India's rice production during the rabi season is approximately the same magnitude as in the corresponding boro and aus seasons in Bangladesh (9.9 million tons in India and 9.33 million tons in Bangladesh in 1996-97). Thus, Bangladesh rice production is only a small share of the total regional production of rice during the aman (kharif) season, while it is approximately half of the regional production in the boro/aus (rabi) season.

Rice production in India is concentrated in the Ganges river basin, Punjab, and the southern states of Andhra Pradesh and Tamil Nadu, (Table 2.2 and Map 2.1). During the rabi (boro/aus) season, rice production in India is much more concentrated, however, with two states, (Andhra Pradesh and West Bengal), together accounting for 65.9 percent of production. Overall, the state of West Bengal produces about 12.6 million metric tons of rice annually, (equal to 15.5 percent of India's production and about two-thirds of Bangladesh rice production). Assam, which borders Bangladesh on the north, has an annual production of about 3.3 million metric tons. The two other states bordering Bangladesh (Meghalaya and Tripura) produce little rice, less than 0.7 million metric tons in total. Average rice yields in West Bengal, (2.18 metric tons/hectare in 1996/97, rice equivalent) are 17 percent higher than in Bangladesh (1.86 metric tons/hectare or 0.75 tons per acre in 1996/97). Yields in Rajshahi division in northwest Bangladesh, where HYV's have been widely adopted, are nearly equal to those in West Bengal, however.

#### GOVERNMENT POLICY AND PUBLIC FOODGRAIN DISTRIBUTION

The public foodgrain distributions in India and Bangladesh share much in common, in part a carry-over from their common colonial experience. In both countries, foodgrain is typically procured at fixed prices. In Bangladesh, most government procurement is done through purchases of grain directly from farmers or traders at the fixed procurement price.<sup>1</sup> In India, fixed procurement prices and state procurement

<sup>1</sup> Local tenders have also been used in recent years, particularly when fixed-price procurement has failed to meet government targets.

targets for rice and wheat are set annually by the central government, and state government institutions or cooperatives procure grain on behalf of the Food Corporation of India (FCI). Non-basmati rice is procured through a levy on rice millers that involves compulsory sales at below-market prices. For example, the procurement price of paddy in rice equivalent terms was on average only 33 percent below the wholesale market price of rice in Dehli from 1995-97, allowing little margin for milling and marketing costs (Dorosh, 1999a).

Until Bangladesh instituted major reforms in the early 1990s, subsidized sales of grain through ration systems were major distribution channels in both countries. In Bangladesh, between 1988/89 and 1990/91, on average 612 thousand MTs of rice and wheat were sold through the Rural Rationing and the urban Statutory Rationing channels, 26.7 percent of total foodgrain distribution (which averaged 2.294 million MTs). Total sales channels, including open market sales and other programs, accounted for 63.5 percent of distribution, with relief and food-for-work channels accounting for the other 36.5 percent of distribution in these years (Table 2.3). Reforms in 1991/92 and 1992/93 closed the Rural Rationing and Statutory Rationing channels, in an effort to improve the targeting of foodgrain distribution, as well as to reduce fiscal costs (Ahmed, Haggblade and Chowdhury, forthcoming). As a result, both the percentage and total amount of foodgrain distributed through targeted and relief channels increased in the mid- to late-1990s, averaging 1.166 million MTs per year from 1995/96 to 1997/98, 72.8 percent of the 1.603 million MT total annual average distribution during these three years.

In India, rationed sales remain the major distribution channel. State governments are responsible for distribution of the foodgrain to ration card holders through fair-price shops; they also determine the size of the ration, price and target group. These distribution programs were not well targeted to the poor and resulted in major costs to the government. (Ahluwalia, 1993; Radhakrishna and Subbarao, 1997, pp. 23, 84). In an effort to reduce costs, reforms in the late 1990s included differential sales prices and

Table 2.3 — Public Foodgrain Distribution in Bangladesh, 1988/89 - 1998/99

Channel	(000 MTs)																	
	1988/89			1989/90			1990/91			1991/92			1992/93			1993/94		
	Rice	Wheat	Total	Rice	Wheat	Total	Rice	Wheat	Total	Rice	Wheat	Total	Rice	Wheat	Total	Rice	Wheat	Total
Statutory Rationing (SR)	0	203	203	7	149	156	46	189	235	0	169	169	0	56	56	0	0	0
Palli Rationing (P & PR)	182	151	333	386	46	432	479	0	479	215	2	217	0	0	0	0	0	0
Essential Priority (EP)	81	56	137	95	46	141	86	57	143	90	60	150	93	62	155	97	65	162
Other Priority (OP)	93	330	423	62	217	279	75	132	207	60	150	210	4	11	15	3	3	6
Large Employee Industries (LEI)	0	40	40	1	34	35	9	32	41	30	28	58	0	13	13	1	13	14
Open Market Sales (OMS)	167	125	292	16	31	47	74	14	88	274	1	275	7	65	72	172	124	296
Flour Mills (FM)	0	87	87	0	168	168	4	278	282	0	254	254	0	87	87	0	18	18
Palli Chakhi (PC)	0	0	0	0	111	111	0	88	88	0	88	88	0	40	40	0	0	0
Market Operation (MO)	0	0	0	0	0	0	0	0	0	0	0	0	7	11	18	0	0	0
Free Sales (FS)	0	0	0	3	0	3	4	7	11	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	29	35
Sales	523	992	1515	570	802	1372	777	797	1574	669	752	1421	111	345	456	279	252	531
Food For Work (FFW)	21	590	611	28	429	457	38	420	458	12	485	497	205	163	368	1	424	425
Test Relief (TR)	141	168	309	71	77	148	70	45	115	52	145	197	104	12	116	13	88	101
Vulnerable Group Development (VGD)	5	501	506	6	181	187	86	139	225	26	204	230	56	77	133	0	167	167
Gratuitous Relief (GR)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Food For Education (FFE)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	78	78
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	57	17	74
Non-Sales	167	1259	1426	105	687	792	194	604	798	90	834	924	365	252	617	71	774	845
Total	690	2251	2941	675	1489	2164	971	1401	2372	759	1586	2345	476	597	1073	350	1026	1376
Non-Sales / Total (%)	24.2	55.9	48.5	15.6	46.1	36.6	20.0	43.1	33.6	11.9	52.6	39.4	76.7	42.2	57.5	20.3	75.4	61.4



ration sizes for households Above the Poverty Line (APL) and Below the Poverty Line (BPL).

### RICE TRADE BY BANGLADESH AND INDIA

India's trade in non-basmati rice up until the mid-1990s was small, and generally limited to public sector exports or imports. Total rice exports in the 1980s averaged only 415 thousand MTs per year, with basmati rice accounting for the bulk of these exports (Table 2.4). In three years, 1984-85, 1988-89 and 1989-90, over 500 thousand MTs of rice were imported. In the early 1990s, total rice export trade increased somewhat to reach 903 thousand MTs in 1993-94. Non-basmati exports accounted for 42.3 percent of the total volume of rice trade from 1992-93 to 1994-95, with exports ranging from 243 thousand to 228 thousand MTs, (Table 2.5).

Private sector exports were liberalized in India in October 1994, though still subject to export quotas. At the same time, FCI stocks of rice soared from 8.5 million MTs of rice on January 1, 1993 to 17.4 million MTs on January 1, 1995, as successive good harvests and increases in procurement combined with a reduction in offtake caused by an increase in sales prices. In order to dispose of aging rice stocks, FCI began exporting large quantities of rice, and as a result, non-basmati rice exports (both public and private) surged to 4.54 million MTs in 1995-96.<sup>2</sup> Thereafter, non-basmati rice exports continued at high levels, averaging 3.17 million MTs per year from 1995-96 to 1998-99. According to Government of India data, Bangladesh was the leading importer in this period, with 26.4 percent of the total value of non-basmati exports, followed by South Africa (10.7 percent) and Indonesia (7.3 percent) (Table 2.6). In all, Africa's share of India's exports was 27 percent. Much of these exports were lower quality, broken rice.

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<sup>2</sup> India's non-basmati exports in the mid-1990s were discounted 20 percent discount (about \$60/MT) relative to Thai export prices. (World Bank, 1996, p.91).

**Table 2.4 — Rice Production, Trade and Stock Changes in India, 1980/81 -1997/98**

Year	Production ( <sup>'000</sup> MT)	Imports ( <sup>'000</sup> MT)	Stock Changes ( <sup>'000</sup> MT)	Exports ( <sup>'000</sup> MT)	Total Supply ( <sup>'000</sup> MT)	Net Imports/ Total Supply (Percent)
1980/81	53,568	4	-7,006	480	46,086	-1.0%
1981/82	53,282	52	2,080	970	54,445	-1.7%
1982/83	47,205	21	7,037	538	53,724	-1.0%
1983/84	60,062	208	-10,118	231	49,921	0.0%
1984/85	58,398	501	-538	199	58,161	0.5%
1985/86	63,910	52	-6,421	316	57,225	-0.5%
1986/87	60,550	22	3,244	254	63,563	-0.4%
1987/88	56,921	26	6,733	390	63,290	-0.6%
1988/89	70,948	706	-10,287	351	61,016	0.6%
1989/90	73,577	593	-3,377	424	70,370	0.2%
1990/91	74,382	146	-3,155	507	70,867	-0.5%
1991/92	74,732	100	3,478	680	77,630	-0.7%
1992/93	72,704	176	4,786	582	77,083	-0.5%
1993/94	80,440	139	-1,398	770	78,411	-0.8%
1994/95	81,080	63	-1,155	903	79,084	-1.1%
1995/96	79,668	53	4,595	4,927	79,389	-6.1%
1996/97	81,374	33	6,503	2,520	85,390	-2.9%
1997/98	83,508	33	5,770	2,142	87,170	-2.4%
Average ( 1980/81 - 1989/90 )	59,842	219	-1,865	415	57,780	-0.3%
Average ( 1990/91 - 1997/98 )	78,486	93	2,428	1,629	79,378	-1.9%

Source: Food Balance Sheets, FAO

**Table 2.5 — India Total Rice Exports, 1992/93 - 1998/99**

	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	Average 1995/96-1998/99
Total Exports (MTs)	580,409	770,000	890,620	4,914,013	2,512,197	2,389,066	4,940,777	2,459,342
Non-Basmati	255,619	242,773	448,495	4,540,699	1,989,040	1,795,743	4,340,175	3,166,414
Basmati	324,790	527,227	442,125	373,314	523,157	593,323	600,602	522,599
Total Exports (Rs.lakh)	97,560	128,672	120,579	456,808	317,236	337,100	620,080	288,537
Non-Basmati	17,496	22,546	34,047	371,741	192,472	168,538	433,455	291,552
Basmati	80,064	106,126	86,532	85,067	124,764	168,562	186,625	141,255
Average Price (Rps/kg) <sup>a</sup>								
Non-Basmati	6.84	9.29	7.59	8.19	9.68	9.39	9.99	9.3
Basmati	24.65	20.13	19.57	22.79	23.85	28.41	31.07	26.5
Exchange Rates								
Rps/\$	26.41	31.36	31.40	33.46	35.50	37.12	42.08	37.0
Tk/\$	39.00	39.84	40.24	40.47	42.22	44.71	47.59	29.2
Average Price (\$/MT)								
Non-Basmati	259.15	296.10	241.78	244.66	272.57	252.84	237.33	251.9
Basmati	933.35	641.78	623.35	680.98	671.77	765.35	738.43	714.1

Note: <sup>a</sup> using CMIE's non-basmati export total of 565,487 MTs, the average price would be 3.99 Rps / Kg, but the average price for 1993-94 is calculated using CMIE's non-basmati export value of 22,546 lakh Rp divided by the total export figure from the FAO Food Balance Sheet of 770,000 MTs less CMIE's basmati rice exports of 527,227 MTs.

Source: Trade data in rupees and metric tons from CMIE, Agriculture, page 401, Sept 1999.

**Table 2.6 — Estimated Volume of India's Non-basmati Rice Exports by Destination, 1992/93 - 1998/99\***

	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	Average 1995/96 - 1998/99
<b>World</b>	<b>255,619</b>	<b>242,773</b>	<b>448,495</b>	<b>4,540,699</b>	<b>1,989,040</b>	<b>1,795,743</b>	<b>4,340,175</b>	<b>3,166,414</b>
Bangladesh	0	0	116,830	1,160,456	150,145	383,499	2,213,088	976,797
South Africa	0	97	1,792	371,351	195,636	259,498	515,819	335,576
Nigeria	0	0	0	24	10,469	126,952	220,676	89,530
Cote d'Ivoire	0	0	0	120,278	3,214	980	158,686	70,789
Saudi Arabia	29,352	60,160	119,662	140,872	262,281	112,664	150,455	166,568
Russia	2,776	0	1,897	128,963	328,110	163,637	140,823	190,383
Somalia	0	420	1,370	8,562	83,283	67,221	112,125	67,798
UAE	21,375	46,948	16,282	133,922	84,534	65,208	80,835	91,124
Mali	0	0	0	14,487	0	0	70,461	21,237
Iran	9,935	43,847	7,522	121,719	67,482	41,756	69,560	75,129
Senegal	10,797	0	5,533	113,963	36,500	58,367	66,036	68,717
Philippines	0	0	0	58,692	60,806	0	55,021	43,630
Yemen	29	0	0	33,456	20,927	58,367	37,699	37,612
Kenya	3,419	108	52,336	373,488	67,710	3,090	36,968	120,314
Malaysia	40,163	0	0	1,026	41	64	31,851	8,246
Benin	0	0	0	11,457	0	6,276	21,057	9,698
Poland	2,352	0	0	22,841	11,967	2,472	20,987	14,567
Singapore	438	7,850	12,883	7,756	8,123	20,255	20,507	14,160
Mauritius	0	0	6,178	10,908	28,481	0	18,905	14,573
Indonesia	0	0	18,297	1,016,042	475	0	18,664	258,795
Japan	73	32	0	3,603	21	4,411	18,654	6,672
Seychelles	0	0	0	3,164	1,292	2,557	18,584	6,399
Morocco	0	0	0	3,506	124	24,336	18,354	11,580
Sri Lanka	30,550	25,046	2,819	73	198,623	134,826	17,252	87,694
Ukraine	0	388	40	13,949	19,852	34,916	15,921	21,159
Tanzania	13,967	97	0	26,921	8,608	3,122	15,590	13,560
Angola	7,816	0	0	25,773	10,117	0	14,769	12,665
South Korea	0	0	0	66,252	744	2,387	13,217	20,650
Gambia	0	0	0	1,661	0	0	11,996	3,414
Others	82,577	57,781	85,057	545,532	329,474	218,882	135,616	307,376
<b>Sub-Total Africa<sup>a</sup></b>	<b>35,999</b>	<b>721</b>	<b>67,208</b>	<b>1,085,543</b>	<b>445,434</b>	<b>552,399</b>	<b>1,300,025</b>	<b>845,850</b>
<b>Average Price (Rp/Mt)<sup>b</sup></b>	<b>6.84</b>	<b>9.29</b>	<b>7.59</b>	<b>8.19</b>	<b>9.68</b>	<b>9.39</b>	<b>9.99</b>	<b>9.31</b>
<b>Share of Total Export (%)</b>								
Bangladesh	0.0	0.0	26.0	25.6	7.5	21.4	51.0	26.4
Africa <sup>a</sup>	14.1	0.3	15.0	23.9	22.4	30.8	30.0	26.8
Others named above	53.6	75.9	40.0	38.5	53.5	35.7	15.9	35.9
Others	32.3	23.8	19.0	12.0	16.6	12.2	3.1	11.0
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Note: <sup>a</sup> Calculated using the value of exports by destination and the average price of total annual non-basmati rice exports.

<sup>b</sup> Average price for 1993-94 is calculated using CMIE's non-basmati export value of 22,546 lakh Rp divided by the total export figure from the FAO Food Balance Sheet of 770,000 MTs less CMIE's basmati rice exports of 527,227 MTs.

<sup>a</sup> Includes Mauritius and Seychelles.

Source: CMIE, 1999; author's calculation.

A major change in macro-economic policy in India, the gradual liberalization of trade and a depreciation of the rupee, also played a major role in increasing the financial returns from exports of rice. Between 1990 and 1996 the rupee was devalued by 50 percent relative to the U.S. dollar, from 17.50 Rps/\$ to 35.43 Rps/\$ (IMF, various years). Given inflation in India of 74.6 percent, and a 9.8 percent increase in the international price of traded goods (here proxied by the U.S. wholesale price index), the real exchange rate depreciation over this period was approximately 27 percent. This real depreciation increased the competitiveness of producers of tradeable goods in India, including rice producers.

Bangladesh, in contrast, has been a consistent net importer of rice throughout the last two decades, though as in India, substantial increases in rice production have reduced net imports over time. In the 1980s, rice imports, (permitted only by the public sector) averaged 266 thousand MTs per year (Table 2.7). During the 1990s, rice imports fell to an average of 133 thousand MTs, though there have been substantial year-to-year fluctuations.

Throughout the 1980s and early 1990s, Thailand was the major source of Bangladesh rice imports. However, the 1994 liberalization that permitted private sector imports coincided with India's rice trade liberalization and build-up of public rice stocks and dramatically changed the rice import trade. India, which enjoys the advantages of lower transport costs, reduced time of delivery (for private sector imports) and the possibility of smaller import contracts delivered by truck, quickly replaced Thailand as the major source of imports of Bangladesh. In 1996/97 and 1997/98, 91.6 percent of Bangladesh rice imports came from India, with the next largest import sources, Pakistan, Vietnam and Thailand, each accounting for only 1-3 percent of the trade, (Table 2.8).

Table 2.7 — Bangladesh Foodgrain Trade, 1980/81 - 1998/99

Year	Food Aid			Commercial			Public Import			Private Import			Total Import		
	Rice	Wheat	Total	Rice	Wheat	Total	Rice	Wheat	Total	Rice	Wheat	Total	Rice	Wheat	Total
1980/81	19	732	751	65	260	325	84	992	1076	0	0	0	84	992	1076
1981/82	30	1111	1141	114	0	114	144	1111	1255	0	0	0	144	1111	1255
1982/83	131	845	976	186	682	868	317	1527	1844	0	0	0	317	1527	1844
1983/84	117	1324	1441	62	553	615	179	1877	2056	0	0	0	179	1877	2056
1984/85	125	1181	1306	570	717	1287	695	1898	2593	0	0	0	695	1898	2593
1985/86	27	1060	1087	10	103	113	37	1163	1200	0	0	0	37	1163	1200
1986/87	108	1317	1425	150	192	342	258	1509	1767	0	0	0	258	1509	1767
1987/88	192	1595	1787	398	732	1130	590	2327	2917	0	0	0	590	2327	2917
1988/89	40	1316	1356	21	759	780	61	2075	2136	0	0	0	61	2075	2136
1989/90	41	908	949	258	326	584	299	1234	1533	0	0	0	299	1234	1533
1990/91	10	1530	1540	0	37	37	10	1567	1577	0	0	0	10	1567	1577
1991/92	39	1375	1414	0	150	150	39	1525	1564	0	0	0	39	1525	1564
1992/93	19	716	735	0	93	93	19	809	828	0	355	355	19	1164	1183
1993/94	0	654	654	0	0	0	0	654	654	74	238	312	74	892	966
1994/95	0	935	935	230	390	620	230	1325	1555	583	430	1013	813	1755	2568
1995/96	1	737	738	487	352	839	488	1089	1577	650	200	850	1138	1289	2427
1996/97	10	608	618	9	103	112	19	711	730	15	222	237	34	933	967
1997/98	0	549	549	0	650	650	0	1199	1199	993	142	1135	992.6	1341	2334
1998/99	59	1174	1233	334	429	763	393	1603	1996	2663	805	3468	3056	2408	5464
Average (1980/81 - 89/90)	83	1139	1222	183	432	616	266	1571	1838	0	0	0	266	1571	1838
Average (1990/91 - 98/99)	15	920	935	118	245	363	133	1165	1298	553	266	819	686	1430	2117

Source: Directorate of Food and NBR.

Table 2.8 — Bangladesh Rice Imports by Source, 1994/95 - 1997/98

Country	Imports ('000 MTs)				Total Import ('000 MTs) (1994/95 - 1997/98)	Share of Total Imports (%) (1994/95 - 1997/98)
	1994/95	1995/96	1996/97	1997/98		
India	575.19	1069.33	145.18	1119.95	2909.65	75.84%
Pakistan	442.12	39.87	16.60	23.82	522.41	13.62%
United States	30.24	56.70	14.77	0.05	101.77	2.65%
Myanmar	90.12	0.00	0.00	1.86	91.98	2.40%
Thailand	46.87	19.33	15.11	0.00	81.31	2.12%
Other Countries <sup>a</sup>	26.52	17.44	0.00	0.00	43.96	1.15%
Canada	0.00	24.48	0.00	0.00	24.48	0.64%
Vietnam	0.00	0.00	0.00	18.76	18.76	0.49%
Mozambique	0.00	0.00	0.00	14.53	14.53	0.38%
Australia	0.00	10.36	0.01	0.03	10.39	0.27%
Nepal	0.00	0.00	0.00	6.86	6.86	0.18%
Japan	4.38	0.01	0.08	0.00	4.46	0.12%
Singapore	0.00	0.02	2.74	0.00	2.77	0.07%
U.K.	0.93	0.00	0.00	0.00	0.93	0.02%
Italy	0.00	0.65	0.00	0.00	0.65	0.02%
Saudia Arabia	0.61	0.00	0.00	0.02	0.63	0.02%
Bhutan	0.00	0.57	0.00	0.00	0.57	0.01%
Sri Lanka	0.00	0.00	0.00	0.26	0.26	0.01%
Other Ocenia	0.00	0.00	0.00	0.03	0.03	**
China	0.00	0.00	0.02	0.00	0.02	**
Chile	0.00	0.02	0.00	0.00	0.02	**
Oman	0.00	0.00	0.01	0.00	0.01	**
United Arab	0.00	0.00	0.00	0.01	0.01	**
Hong Kong	0.00	0.00	0.00	0.00	0.00	**
Philippines	0.00	0.00	0.00	0.00	0.00	**
Netherlands	0.00	0.00	0.00	0.00	0.00	**
Germany	0.00	0.00	0.00	0.00	0.00	**
<b>Total</b>	<b>1216.99</b>	<b>1238.75</b>	<b>194.54</b>	<b>1186.17</b>	<b>3836.45</b>	<b>1.00</b>

Note: \*\* indicates less than 0.01 percent.

<sup>a</sup> countries not specified in 1994/95 and/or 1995/96.

Source: Foreign Trade Statistics of Bangladesh, BBS.

### 3. PRIVATE SECTOR RICE TRADE BETWEEN INDIA AND BANGLADESH

The liberalization of rice exports in India and rice imports in Bangladesh discussed in the preceding chapter increased market supplies of rice and, as will be shown, stabilized prices in Bangladesh following production shortfalls in 1997/98 and 1998/99. This section begins with a description of rice import flows and prices in these periods, showing how the import parity price of rice effectively set a ceiling over rice prices in Bangladesh. Evidence on rice availability per capita in Bangladesh and calculations of rice demand are then used to attempt to assess the contribution of rice imports to total supply and explain the differences between Indian export and Bangladesh import data.

#### PRODUCTION SHORTFALLS AND BANGLADESH RICE IMPORTS FROM INDIA

Soon after the liberalization of international trade of rice in 1994, Bangladesh imported substantial quantities of rice from India during a period of three successive poor Bangladesh rice harvests. Severe drought reduced the size of the aman 1994/95 harvest; fertilizer shortages reduced the size of the 1995 boro crop;<sup>3</sup> and further bad weather reduced the 1995/96 aman crop, as well.<sup>4</sup> Given the poor harvests, there was a substantial

<sup>3</sup> The 1994/95 aman crop was small, leading to increased market prices and greater incentives for producers in the following boro season. However, the Bangladesh Ministry of Agriculture had authorized a large level of fertilizer exports, based on projections assuming normal price and weather conditions. Farmers, responding to high paddy prices in the boro planting season, increased their demand for fertilizer. Fertilizer shortages ensued, the open market price of fertilizer rose and the production of boro rice was only 6.54 million MT (3.5 percent below the previous year's harvest).

<sup>4</sup> After the poor aman harvest in 1994/95, the Bangladesh government attempted to import 800,000 MTs of rice through open tenders in February, 1995. However, contract problems involving specification and inspection contributed to delayed import arrivals, and subsequent increases in world rice prices made the export sales less attractive to exporters. As a result, only 350,000 metric tons of rice had arrived within eight months, with final deliveries not arriving until April 1996.

excess of demand over supply at import parity prices, so that 1.127 million metric tons, (an average of 66 thousand metric tons per month), were imported by the private sector, in addition to 704 thousand metric tons imported by the government.

### *The 1997/98 Aman Rice Shortfall in Bangladesh*

Rice flows between the two countries came nearly to a halt in 1996 and 1997, however, as favorable weather and stable input supplies helped boost rice production and drop domestic market prices below import parity levels (Figure 3.1).<sup>5</sup> But, following another poor aman rice harvest in Bangladesh in November/ December, 1997 rice prices rose sharply, and within two months of the start of the aman harvest, again reached import parity levels.<sup>6</sup>

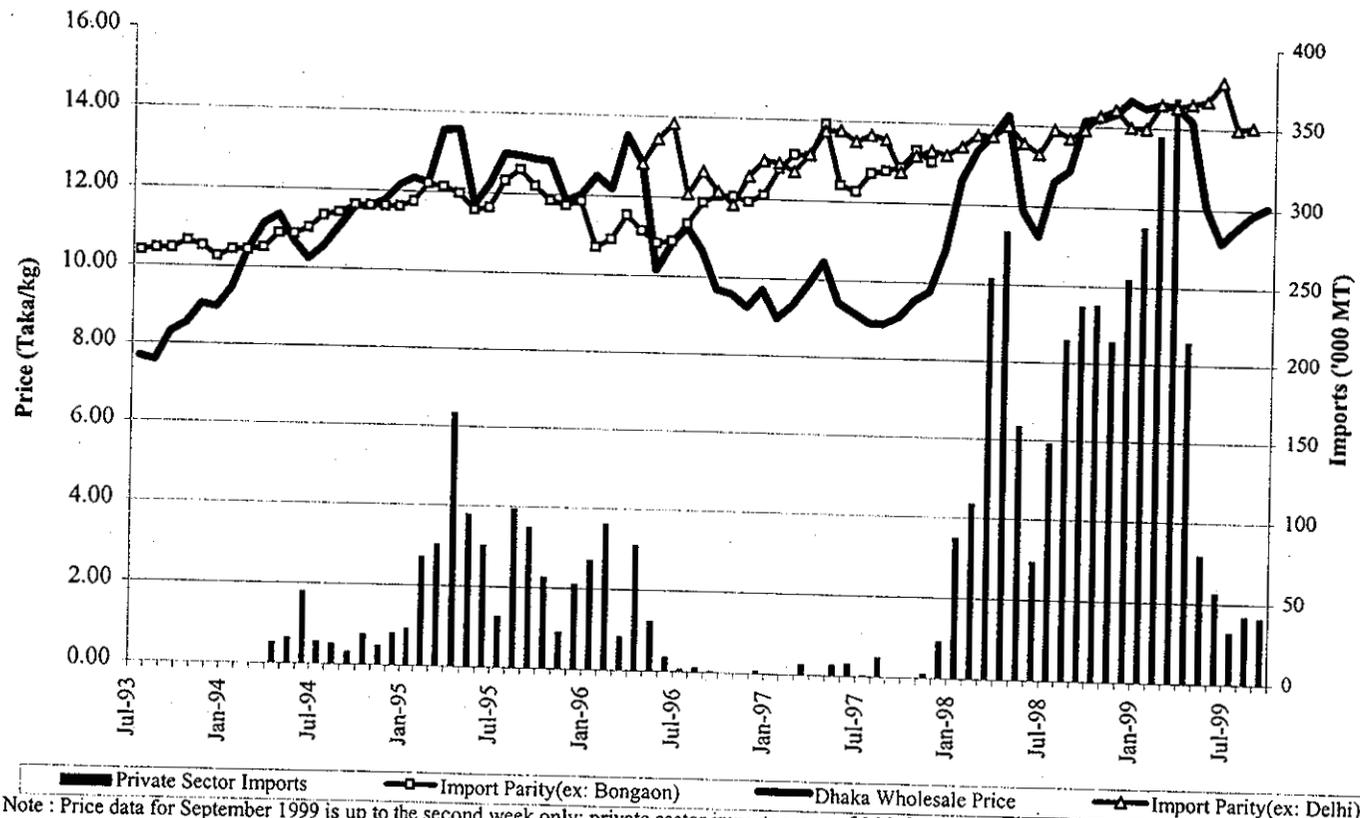
Despite pressure for immediate large-scale foodgrain imports, the Bangladesh Ministry of Food opted for a cautious strategy involving only moderate increases in government imports of rice and wheat. Instead, the government encouraged private sector food imports through removal of a surcharge on rice imports, and increased OMS sales and distribution to poor households, while maintaining adequate foodgrain stock levels. Given the price incentives for imports and the large gap between domestic supply and demand, 917,000 MTs of rice were imported by the private sector through official channels from December 1997 to May 1998.

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<sup>5</sup> In fact, prices during this period even fell below export parity so that, in principle, Bangladeshi rice exports would have been competitive with Indian exports in the world market. As discussed in Rahman (1998), however, lack of established market links and appropriate grading standards prevented exports from taking place.

<sup>6</sup> For example, wholesale prices of coarse rice in Dhaka, rose by 30.2 percent between October and the end of December, 1997, from 9.45 Tk/kg to 12.30 Tk/kg.

Figure 3.1 — Rice Prices and Quantity of Private Imports in Bangladesh, 1993-99



Private Sector Imports    
  Import Parity(ex: Bongaon)    
  Dhaka Wholesale Price    
  Import Parity(ex: Delhi)

Note : Price data for September 1999 is up to the second week only; private sector imports are as of 14th September, 1999. From November 1998, the carrying cost has increased by 1.1 Tk/kg to 4.1 Tk/kg.

Source : Dorosh (1999), calculated using data from FPMU, CMIE (1998,1999) and Baulch, Das et. al, (1998).

### *Rice Imports After the 1998 Bangladesh Flood*

A good boro rice harvest in May 1998 brought a sharp decline in rice imports from India as prices dropped below import parity. But from July through September, floods in Bangladesh destroyed 300 thousand MTs of the aus crop and caused extensive damage to seedbeds and transplanted seedlings for the aman crop.<sup>7</sup> Government rice policy was based on the realization that government imports and food aid, alone, would not be sufficient to make up the projected 1.9 million MT shortfall in food grain supply before the wheat and boro harvests in April to June of 1999.

As the Government of Bangladesh continued its policy of encouraging private sector imports, the private sector imported more than 200 thousand MTs of rice per month from August 1998 to March 1999, with private rice imports reaching 288 thousand MTs in January and 345 thousand MTs in February, 1999.<sup>8</sup>

In comparison with private sector rice imports, government interventions in the domestic rice market were small, only 399 thousand MTs from July 1998 through April 1999. Private sector rice imports, equal to 2.42 mn MTs in this period, were thus 6.1 times larger than government rice distribution.<sup>9</sup>

Thus, because of the poor 1997/98 aman harvest and the flood-damaged aus and aman harvests in 1998/99, Bangladesh rice prices (wholesale Dhaka) remained close to ex: India import parity prices for most of calendar year 1998.<sup>10</sup> Wholesale prices after the flood were in fact remarkably stable. The national average wholesale prices of coarse

<sup>7</sup> With the onset of the boro rice harvest in May, the national average wholesale price of coarse HYV rice fell from a peak of 14.2 Tk/kg in April to 12.0 Tk/kg in June and private imports slowed to 59,000 MTs in June.

<sup>8</sup> As discussed below, the extremely high figures for recorded rice imports in early 1999 may overstate actual rice imports. It is possible that other commodities were imported using false invoices to avoid import tariffs and other surcharges.

<sup>9</sup> Government distribution was nonetheless important, however, in that it brought an increase in food entitlements and purchasing power to needy households. 57.7 percent of rice distribution was targeted to flood-affected households through Vulnerable Group Feeding (41.5 percent) and Gratuitous Relief (16.2 percent).

<sup>10</sup> In Figure 3.1, a marketing margin of 2 Tk/kg is used to calculate the West Bengal import parity prices shown for July, 1993 to September, 1997.

rice remained in the range of 14.14 to 14.83 Tk/kg from September 1998 through mid-April 1999.<sup>11</sup> With a good boro harvest in April and May, market prices fell by 19 percent, from 14.46 Tk/kg (aman coarse rice) in the third week of April to 11.74 Tk/kg (boro HYV rice) in the second week of May (DAM data), bringing to an end a nine-month period of high rice prices and concerns about post-flood food availability.

#### ALTERNATE ESTIMATES OF THE VOLUME OF RICE TRADE

The behavior of market prices in Bangladesh suggests that rice imports from India were a major source of supply. The volume of this rice trade remains somewhat uncertain, however, for two major reasons. First, Bangladesh import data differ substantially from India export data. Second, calculations of total availability of rice in Bangladesh are not consistent with market price movements and estimated rice demand.

#### *Comparisons of Import and Export Data*

Table 3.1 compares Bangladesh rice import and India rice export data since the liberalization of private sector rice trade by Bangladesh in 1994.<sup>12</sup> As shown, the Bangladesh customs data indicate that 3.172 million MTs of rice were imported from India from April 1998 through March 1999, 2.827 million MTs, (89.1 percent) by the private sector. Indian data on the quantity of rice exports to Bangladesh was unavailable, but this number can be approximated using the values of basmati and non-basmati rice

<sup>11</sup> Note that Figure 3.1 shows that domestic prices were 0.5 to 2.0 Taka below ex: Delhi import parity prices from May through August 1998, yet private sector imports continued. The main explanation is that rice exports during this period originated mainly from West Bengal's rabi (boro) crop, where prices are generally 1.5 to 2.0 Taka/kg less than Delhi prices during this season (as evidenced in the data from 1996 and 1997).

<sup>12</sup> The data are presented according to India's April-March fiscal year in order to permit direct comparison.

**Table 3.1 — Comparison of Bangladesh Rice Import and India Rice Export Data, 1994/95 - 1998/99**

	1994-95	1995-96	1996-97	1997-98	1997-98	1998-99
<b>Bangladesh Imports from India ('000 MTs)</b>						
Private Sector	327	862	133	505	505	2,827
Public Sector	6	674	47	5	5	345
Total	333	1,536	180	510	510	3,172
Other Public Rice Imports (Food Aid)	0	1	5	0	0	58
<b>India Exports to Bangladesh (mn Rs)</b>						
Non-basmati	887	9,503	1,453	3,599	3,599	22,102
Basmati	2	15	0	8	8	43
Total	889	9,518	1,453	3,608	3,608	22,145
<b>Price of India Exports to Bangladesh (Rps/kg)</b>						
Non-basmati	7.59	8.19	9.68	9.39	8.65	9.99
Basmati	19.57	22.79	23.85	28.41	28.41	31.07
<b>Exchange Rate (Rps/Tk)</b>						
	0.780	0.825	0.841	0.826	0.826	0.883
<b>Price of India Exports to Bangladesh (Rps/kg)</b>						
Non-basmati	9.73	9.93	11.51	11.37	10.47	11.32
Basmati	25.08	27.63	28.37	34.40	34.40	35.21
<b>India Exports to Bangladesh ('000 MT est.)</b>						
Non-basmati	116.8	1160.7	150.1	383.5	416.2	2213.1
Basmati	0.1	0.7	0.0	0.3	0.3	1.4
Total	116.9	1161.4	150.2	383.8	416.5	2214.5
<b>Ratio India Exports/Bangladesh Imports (Total Rice)</b>						
	35.1%	75.6%	83.4%	75.3%	81.7%	69.8%

Notes: Data shown are for April - March Fiscal Years.

Source: Calculated from CMIE, 1999 and FPMU.

exports to Bangladesh and the average prices of total Indian exports of these two types of rice.<sup>13</sup> The quantity of India's rice exports to Bangladesh in 1998-99, thus calculated, is only 2.215 million MTs, 958 thousand MTs (30.2 percent) less than the Bangladesh customs figures. The data for 1997-98 are similar: the calculated volume of India's rice exports to Bangladesh is 384 thousand MTs, 24.7 percent less than the figure from Bangladesh customs. Note that the Taka average price of exports used here, (11.3 Tk/kg in 1998/99), is not unreasonably high given a wholesale price in Dhaka of 14-14.5 Tk/kg for coarse rice and an estimated 2.0 to 2.5 Tk/kg marketing margin between Indian land ports and Dhaka wholesale.

Using a lower average export price raises the calculated volume of exports. For example, evaluated at the average wholesale price of Perimal rice in Delhi, calculated rice exports from India rise to 417 thousand MTs and 2.372 million MTs in 1997-98 and 1998-99, respectively, (19.3 and 26.2 percent below) the Bangladesh figures for these years.

One possible explanation for the discrepancies in the data is that other commodities which faced import duties were falsely declared as rice, for which the import duty was zero. For example, in June, 1999 the import duty was 37.5 percent for cement, most fresh fruit and spices, 25 percent for sugar and 5 percent for Single Super Phosphate (SSP) fertilizer and mustard seeds (Government of Bangladesh, 1999). Capital flight from Bangladesh might also provide part of the explanation, as Bangladesh importers might have over-invoiced the imports, enabling excess payments to counterparts in India.<sup>14</sup> Of course, it is possible that there are simply reporting mistakes in one or both countries, involving double-counting of imports in Bangladesh or under-counting of exports in India. A perfect match between the data of the two countries would in any case be almost impossible because of likely differences in reporting periods.

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<sup>13</sup> Non-basmati rice accounted for 99.8 percent of the value of rice exports to Bangladesh in 1998-99, (CMIE, 1999).

<sup>14</sup> In this case, the over-invoicing would appear to involve an overstatement of the quantity of imports, rather than the price of imports. Yet, on the India side, there is no evidence of this possible overpayment.

As shown in Table 3.2, there are substantial differences between Bangladesh import and Indian export data overall, though in this case the difference in fiscal years is likely a major factor. Overall, India's export figures are higher, not lower, than Bangladesh import figures, however, with manufactured goods, accounting for the major difference.

#### *Rice Availability and Market Prices in Bangladesh*

Examination of calculated rice availability and movements in market prices in Bangladesh give another indication of the volume of rice imports from India in recent years (Table 3.3). In 1996/97, the most recent Bangladesh fiscal year in which private imports were negligible (only 35 thousand MTs), net supply (calculated as the sum of net production, net government distribution (off-take less domestic procurement), and private imports, assuming no change in private stocks), was 17.259 million MTs. Using the 1996/97 level of per capita consumption and the real price of rice as a base, per capita demand of rice in each period is calculated using the percentage change in the real price of rice and an assumed own-price elasticity of demand of rice of  $-0.15$ . Then, using the level of population in each period, total rice consumption is estimated. Finally, the difference between net supply and the calculated demand is reported as the implicit private stock change.

Thus, for example, real prices of coarse rice (national average) in the December through April period following the 1996/97 aman rice harvest averaged 9.57 Tk/kg, 0.63 percent higher than the average real price for 1996/97. Assuming an own-price elasticity of demand for rice of  $-0.15$ , per capita consumption of rice fell by  $-0.09$  percent (approximately equal to  $0.63$  times  $-0.15$ ). Total demand for the period is estimated at

**Table 3.2 — Bangladesh Total Imports from India, 1997/98**

Items	(1) Bangladesh Import Data Value (million Tk.)	(2) India Export Data Value (million Tk.)	(3) Difference (1)-(2)	(4) Difference as a Percentage of Bangladesh Data, (3)/(1)
Agricultural and allied products	12,693	6,649	6,045	47.6
Rice	10,557	4,283	6,274	59.4
Fresh fruits	799	489	310	38.8
Fresh vegetables	21	312	(291)	-1390.3
Spices	629	117	512	81.4
Others	688	1,447	(759)	-110.4
Ores and minerals	3,748	1,321	2,428	64.8
Manufactured goods	2,991	25,897	(22,906)	-765.7
Leather and leather manufactures	1,004	20	983	98.0
Chemicals and related products	2,428	2,256	172	7.1
Engineering goods	9,450	7,052	2,398	25.4
Ready-made garments (RMG)	630	43	587	93.2
Textiles (excluding RMG)	13,881	12,811	1,070	7.7
Other manufactured goods	195	3,714	(3,519)	-1805.3
Other commodities	143	916	(773)	-541.0
<b>All commodities</b>	<b>47,164</b>	<b>60,680</b>	<b>(13,515)</b>	<b>-28.7</b>

Note: India data in rupees are converted to Taka using an exchange rate of Taka 1.19 per rupee.

Source: BBS, Foreign Statistics of Bangladesh 1997-98; CMIE, Foreign Trade and Balance of Payments, July 1999.

Table 3.3 — Estimated Rice Demand and Implicit Private Stock Change, 1996/97-1998/99

	1996/97 total year Dec-Nov	1996/97 aman Dec-Apr	1997 boro, aus May-Nov	1997/98 aman Dec-Apr	1998 boro,aus May-Nov	1998/99 aman Dec-Apr	Total Dec 97 - Apr 99
(mn MTs, unless otherwise noted)							
<b>Rice Production</b>	18.884	9.550	9.334	8.850	9.595	7.700	
<b>Aman</b>	9.550	9.550	0.000	8.850	0.000	7.700	
<b>Boro</b>	7.460	0.000	7.460	0.000	7.979	0.000	
<b>Aus</b>	1.874	0.000	1.874	0.000	1.616	0.000	
<b>Losses, seed, etc. (10 percent)</b>	1.888	0.955	0.933	0.885	0.960	0.770	
<b>Net Production</b>	16.996	8.595	8.401	7.965	8.636	6.930	
<b>Dom Proc (Dec-Apr) / (May-Nov)</b>	0.444	0.201	0.243	0.040	0.322	0.057	
<b>Offtake from Government Stocks</b>	0.672	0.365	0.307	0.299	0.365	0.170	
<b>Private imports</b>	0.035	0.004	0.031	0.758	1.285	1.472	
<b>Supply less private stock change</b>	17.259	7.160	10.112	6.999	9.883	7.050	
<b>Demand</b>	17.259	7.160	10.112	6.999	9.883	7.050	
<b>Implicit Private Stock Change (a)</b>	9.678	1.603	-1.616	1.983	0.081	1.465	3.546
<b>Stock Change Relative to   1996/97(b)</b>		0.000	0.000	0.379	1.697	-0.138	1.953
<b>Price of Rice (Tk/kg)</b>	0.000	9.572	9.754	12.982	13.240	14.402	
<b>Real Price (Tk/kg) (1996/97 prices)</b>	9.553	9.572	9.535	12.405	12.367	13.150	
<b>Per capita demand (kgs/period)</b>	70.443	58.686	82.208	56.447	79.063	55.956	
<b>Change in per capita demand</b>	0.00%	-0.03%	0.03%	-3.84%	-3.80%	-4.68%	

Notes: (a) Also includes possible overestimates of production and imports, and underestimates of consumption.

(b) Equals the difference between the implicit stock change in the season specified with the implicit stock change in the same season in 1996/97.

7.155 million MTs, resulting in an implicit private stock change of 1.61 mn thousand MTs between the start of December 1996 and the end of April 1997.<sup>15</sup>

The calculations suggest that, given the sharp increase in average real prices of rice in Bangladesh following the poor aman rice harvest in December 1997 and the floods in mid-1998, per capita demand was 3.85 to 4.83 percent less than its base level from December 1997 through April 1999. This reduction in per capita demand suggests an implicit stock change (the difference between apparent availability and estimated demand) of 3.546 mn MTs over the seventeen-month period. A change in private stocks of this magnitude seems highly unlikely, given that the periods are defined to end just before major harvests.

Three other major factors might account for this large discrepancy between calculated demand and net supply: overestimate of production, overestimate of imports and underestimate of consumption. These are illustrated in Figure 3.2, which shows the amount of imports following a major production shortfall. This amount of imports depends on the level of production shortfall (that determines the location of supply curve S1), the amount of private stock change (that can also shift S1), and the slope of the demand curve (D). Since production is the largest single determinant of the supply and the implicit stock change, a rather small percentage change in production estimates could account for the difference between net supply and estimated demand. For example, a 9.2 percent overestimation of total net rice production of the four rice harvests from December 1997 through May 1999 (excluding the 1999 boro crop) of 23.53 million MTs, would account for the entire implicit stock change. Similarly, the 1.083 million MT total

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<sup>15</sup> The entire boro rice harvest is assumed to be available for consumption on June 1. This approximates the actual timing of the boro harvest, a major portion of which typically reaches the market by mid-May.

discrepancy between Bangladesh import and Indian export data reported in Table 3.1, is equal to almost exactly half (49.9 percent) of the implicit stock change.

Figure 3.2 — Effects of a Production Shortfall

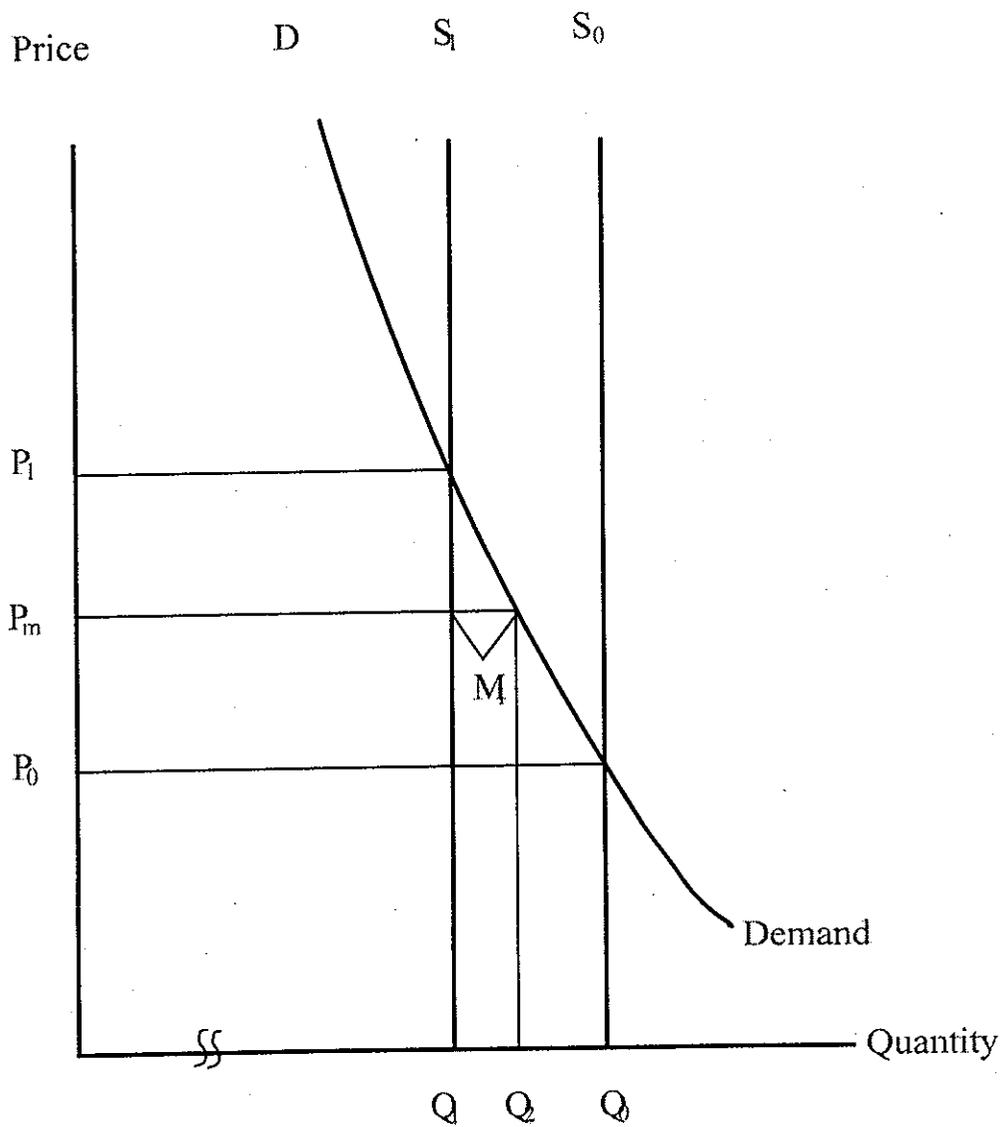


Table 3.4 — Implicit Private Stock Changes under Alternative Assumptions for Own-Price Elasticity of Rice Demand

Own-Price Elasticity of Rice Demand	1996/97 total year Dec-Nov	1996/97 aman Dec-Apr	1997 boro, aus May-Nov	1997/98 aman Dec-Apr	1998 boro,aus May-Nov	1998/99 aman Dec-Apr	Total Dec 97 - Apr 99
(million metric tons)							
elasticity = 0.0							
Implicit Private Stock Change (a) Stock Change Relative to 1996/97(b)	0.000	1.601 0.000	-1.613 0.000	1.703 0.102	-0.309 1.304	1.119 -0.482	2.512 0.923
elasticity = -0.1							
Implicit Private Stock Change (a) Stock Change Relative to 1996/97(b)	0.000	1.603 0.000	-1.615 0.000	1.891 0.288	-0.048 1.567	1.351 -0.251	3.194 1.604
elasticity = -0.15							
Implicit Private Stock Change (a) Stock Change Relative to 1996/97(b)	0.000	1.603 0.000	-1.616 0.000	1.983 0.379	0.081 1.697	1.465 -0.138	3.528 1.938
elasticity = -0.2							
Implicit Private Stock Change (a) Stock Change Relative to 1996/97(b)	0.000	1.604 0.000	-1.617 0.000	2.073 0.469	0.208 1.825	1.577 -0.027	3.858 2.266

Notes: (a) Also includes possible overestimates of production and imports, and underestimates of consumption.

(b) Equals the difference between the implicit stock change in the season specified with the implicit stock change in the same season in 1996/97.

Source: Author's calculations.

Plausible changes in the slope of the demand curve, as measured by the own-price elasticity of demand, have a smaller effect on the calculations of implicit stock change. As shown in Table 3.4, a less price-responsive (more price-inelastic) demand implies a smaller reduction in demand following the large price increases, and thus a smaller implicit stock increase. However, even with an own-price elasticity of demand of zero (as compared to  $-0.15$  used in Table 3.3), the implicit stock change is still 2.512 million MTs.<sup>16</sup>

In principle other factors could affect the calculations of implicit stock change including demand factors such as shifts in income or cross-price effects. But given that the own-price elasticity of rice appears to be rather small, and that little widespread per capita income growth was likely in this period that included two major rice production shortfalls and a major flood, significant positive income effects on demand seem unlikely. Similarly, given the low cross-price effects of other prices on rice consumption (owing to the large budget share of rice), cross-price effects are likely also to be negligible.

The above calculations strongly suggest that total supply has been over-estimated in the December 1997 through May 1999 period. An over-estimate of Bangladesh rice imports is insufficient in itself to explain the large implicit stock change, (assuming these imports were at least as large as stated in the India export data). Nonetheless, an overestimate of imports could account for as much as half of the difference between net supply and estimated rice demand.

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<sup>16</sup> Moreover, note that an own-price elasticity of demand of  $-0.15$ , though consistent with time series estimates shown in Dorosh (1999a) is low compared to cross-section estimates of  $-0.56$  from Goletti (1993).

#### 4. PRIVATE IMPORTS AND FOOD SECURITY: IMPLICATIONS OF TRADE WITH INDIA

Though the quantity of private sector imports from India is uncertain, it is clear that this trade substantially augmented Bangladesh rice supplies in 1997/98 and 1998/99. One measure of the impact of this trade on national food security in Bangladesh is to estimate rice prices in Bangladesh and import quantities in the absence of private sector imports from India. Two other major issues related to the private sector import trade and food security are then addressed. First, is the private sector trade competitive or might it be manipulated through collusion by traders? Second, how reliable is India as a source of supply?

##### MARKET PRICES IN THE ABSENCE OF PRIVATE SECTOR TRADE

Given the average wholesale price of coarse rice in Dhaka of 13.3 Tk/kg in 1998/99, rice imports from December 1997 through November 1998 were 2.043 million MTs, (according to the Bangladesh customs data). Had rice imports from India not been available, the next lowest cost source for private importers would have been Thailand,<sup>17</sup> for which the import parity price of 15 percent broken rice in Dhaka in the same period was 16.1 Tk/kg. Given the 20.9 percent increase in import parity price, estimated rice demand would fall by between 4.2 and 6.3 percent, assuming an own-price elasticity of rice demand of  $-0.2$  to  $-0.3$ . In this case, rice imports would decline by approximately 700 thousand to 1 million MTs.<sup>18</sup>

If private sector imports were unavailable (or banned) from any source, then, with no change in government imports, then total supply would have been 12.1 percent less

<sup>17</sup> Bangladesh consumes mostly parboiled rice. (In the parboiling process, the paddy is first boiled and then milled.) The other major Asian exporter, Vietnam, sold only white (non-parboiled) rice in this period.

<sup>18</sup> This calculation assumes no problems with supply of imports from Thailand, an issue discussed below.

(apart from private stock changes) and rice prices could have risen by 40 to 60 percent, to an average of between 18.7 Tk/kg and 21.3 Tk/kg.<sup>19</sup> Such an increase in the rice price level would likely have been unacceptable to the Government of Bangladesh and public sector imports would have been increased. But public sector imports of a magnitude equal to private sector flows would not have been feasible.

During the 1998 calendar year alone, private sector imports, mainly from India, reached 2.26 million MTs. Government imports and subsidized sales of this magnitude were simply not feasible. Had the government of Bangladesh imported this grain itself, the average cost of the imported rice delivered to local delivery points would have been approximately 14.9-15.9 Tk/kg, 1.0 to 2.0 Tk/kg above the private sector import costs, due to additional marketing costs totaling 50 to 100 million dollars. And, if the government received a net price of 11.5 Tk/kg (equal to the Open Market Sales price of 12.0 Tk/kg less 0.5 Tk/kg OMS dealer's commission), the total unit subsidy would have been 3.4 to 4.4 Tk/kg, and the total fiscal cost would have been 160 to 210 million dollars.

#### COMPETITIVENESS OF THE PRIVATE SECTOR IMPORT TRADE IN BANGLADESH

In spite of the potentially high costs of massive government imports, such expenditures might be deemed necessary if there was evidence that private traders were manipulating the market. One indication that the rice market was competitive in Bangladesh was that the margin between wholesale prices in Dhaka and India remained relatively low and stable.<sup>20</sup> Data from letters from both 1994-95 and 1998 suggest that a

<sup>19</sup> In the absence of private sector imports, domestic supply would have been 14.839 mn MTs, a 12.1 percent reduction in per capita supplies relative to the actual estimated levels. Assuming an elasticity of demand of  $-0.2$  to  $-0.3$ , prices would need to rise by  $12.1/0.3$  (40 percent) to  $12.1/0.2$  (60 percent) to equilibrate market supply and demand.

<sup>20</sup> As indicated in Figure 3.1, the marketing margin for shipment of rice by truck increased by approximately 1.1 Tk/kg in November 1998 due to new weight restrictions on truck loads in both India and Bangladesh.

large number of traders participated in rice imports, another indication of a competitive market.<sup>21</sup>

Letter of credit data from 1994/95 indicate that most of the rice imported from India came in small lots. The average size of the 1251 shipments of rice in 1994/95 was only 707 metric tons. Letter of credit data from January through mid-September 1998 indicate an even smaller average quantity of only 268.7 metric tons per letter of credit for the 3291 letters of credit issued. Moreover, these letters of credit were opened by 793 different traders, with an average amount of imports per trader of only 1115.3 MTs of rice. The largest ten traders (in terms of total imports) imported 142,369 tons, 16 percent of the total. Given this broad participation in the rice import trade, and the small share of the largest suppliers, it appears that there has been little scope for individuals or a small group of traders to significantly affect market prices by restricting market supply, (Dorosh, 1999a).

However, private sector imports from Thailand are likely to involve far fewer traders because of economies of scale in sea shipments. Whereas, cross-border trade involves shipments of approximately 10 metric tons per truck or 70 metric tons per railway wagon (generally grouped together in a rack of 24 wagons carrying about 1600 metric tons), typical ocean shipments involve 10,000 to 15,000 metric tons of rice. Thus, instead of hundreds of participating traders, it is likely that only the larger traders would be able to finance these large shipments. Of course, competition is still possible even if the number of importers is only five or ten, but the risk of collusion is high.<sup>22</sup>

### THE RELIABILITY OF THE INDIAN RICE MARKET<sup>23</sup>

Fortunately for Bangladesh, market supplies of rice in India in 1998/99 were plentiful. Production of the kharif rice crop was 70 million MTs, only about 2.6 percent below the 1997/98 bumper crop. Moreover, Food Corporation of India rice stocks on 1

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<sup>21</sup> See Murshid, 1999 for details of the private sector rice import trade.

<sup>22</sup> One safeguard against collusion is to encourage international grain companies to participate in the import trade as well.

October, 1998 were quite high (8.7 mn MTs), nearly three million MTs above the buffer stock norm of 6 million MTs for that date. Wheat stocks were even higher: 15.8 million MTs on 1 September, 1998.

Large-scale private imports from India were possible in 1998/99 because with large government stocks of foodgrain and a good rice harvest, the Government of India was willing to allow exports. Had stocks and/or production been lower, an export quota or even an export ban could have been imposed. One important factor, then, is the probability that both Bangladesh and India will have poor rice harvests in the same year.

As shown in Table 4.1 and Figure 4.1, from 1971/72 through 1998/99, total production of rice in Bangladesh fell below five percent or more below trend in only four years: 1971/72, 1972/73, 1994/95 and 1998/99. India's production has been more variable over the period as a whole, with six years below trend: 1974/75, 1976/77, 1979/80, 1982/83 1986/87 and 1987/88. However, from 1988/89 to 1998/99, in no year did India's annual rice production fall more than 5 percent below trend.

One reason for the greater stability in Bangladesh annual production is that the boro harvest, coming only after about five months of the aman harvest, acts as a natural stabilizer of domestic production. Poor aman harvests are often followed immediately by good boro harvests due to greater price incentives for production, enhanced government extension and input supply efforts, and a desire on the part of farmers to build up own-stocks of rice.

Comparing, only aman production in Bangladesh with kharif production in India, gives a somewhat different story. From 1980/81 through 1998/99, production of aman in Bangladesh fell below trend in four years: 1981/82, 1987/88, 1988/89 and 1998/99, but in these latter two years, aman production was 17.44 (1988/89) and 18.33 percent (1998/99)

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<sup>23</sup> This section draws heavily from Dorosh 1999b.

**Table 4.1 — Total Production of Aman and Kharif Rice In Bangladesh and India and Percentage Deviation from Trend, 1981-99**

Year	BANGLADESH				INDIA			
	Aman Prod 000 MT	Percentage Deviation	Total Prod 000 MT	Percentage Deviation	Kharif Prod 000 MT	Percentage Deviation	Total Prod 000 MT	Percentage Deviation
1980/81	7962	6.08%	13880	2.69%	50090	2.43%	53630	0.68%
1981/82	7208	-5.23%	13629	-1.57%	49245	-2.09%	53250	-3.20%
1982/83	7603	-1.33%	14215	0.28%	42697	-17.40%	47120	-16.98%
1983/84	7937	1.68%	14509	0.02%	55052	3.70%	60100	2.73%
1984/85	7931	0.32%	14623	-1.43%	53782	-1.29%	58340	-3.16%
1985/86	8540	6.67%	15038	-0.84%	59392	6.28%	63830	2.97%
1986/87	8267	1.99%	15406	-0.57%	53561	-6.49%	60560	-4.98%
1987/88	7689	-6.30%	15413	-2.60%	49049	-16.41%	56860	-13.16%
1988/89	6857	-17.44%	15544	-3.77%	63376	5.50%	70490	4.86%
1989/90	9202	9.47%	17856	8.33%	65878	7.17%	73570	6.67%
1990/91	9167	7.77%	17852	6.18%	66317	5.49%	74290	5.06%
1991/92	9269	7.70%	18252	6.47%	66368	3.28%	74680	3.07%
1992/93	9680	11.19%	18341	4.98%	65243	-0.63%	72868	-1.80%
1993/94	9419	6.96%	18041	1.35%	70724	5.47%	80298	5.73%
1994/95	8504	-4.51%	16833	-7.16%	72603	6.07%	81814	5.31%
1995/96	8790	-2.40%	17687	-4.19%	67879	-2.82%	76975	-3.10%
1996/97	9552	4.90%	18883	0.50%	71415	0.24%	81312	0.16%
1997/98	8850	-3.87%	18850	-1.41%	72500	-0.19%	83500	0.69%
1998/99	7600	-16.87%	18853	2.34%	71450	-2.97%	82450	-2.62%

Note: Trend Values have been derived from Linear Regression.

Figure 4.1 — Total Production of Rice in Bangladesh and India, 1972-99 (Percentage Deviation from Trend)

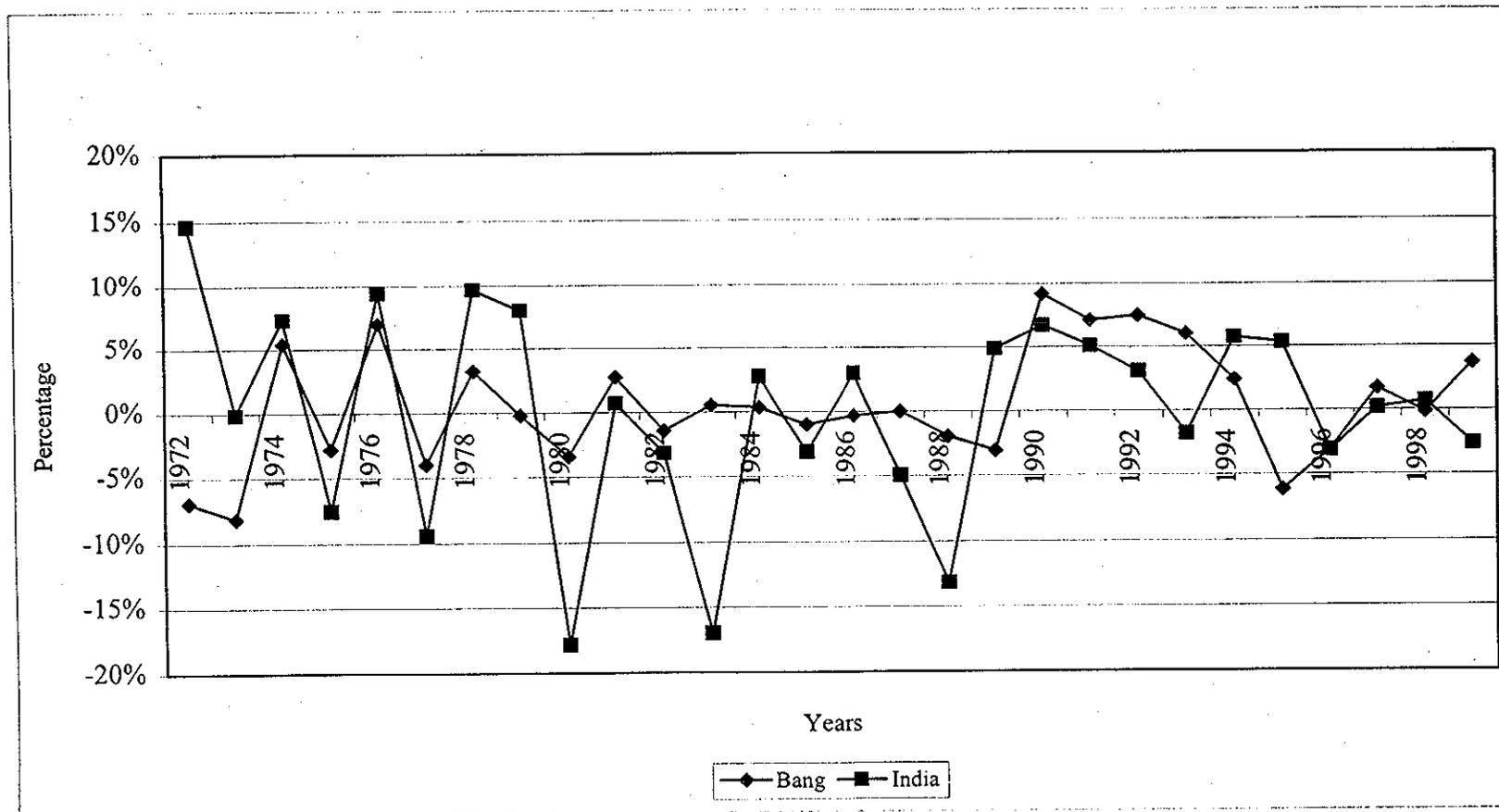
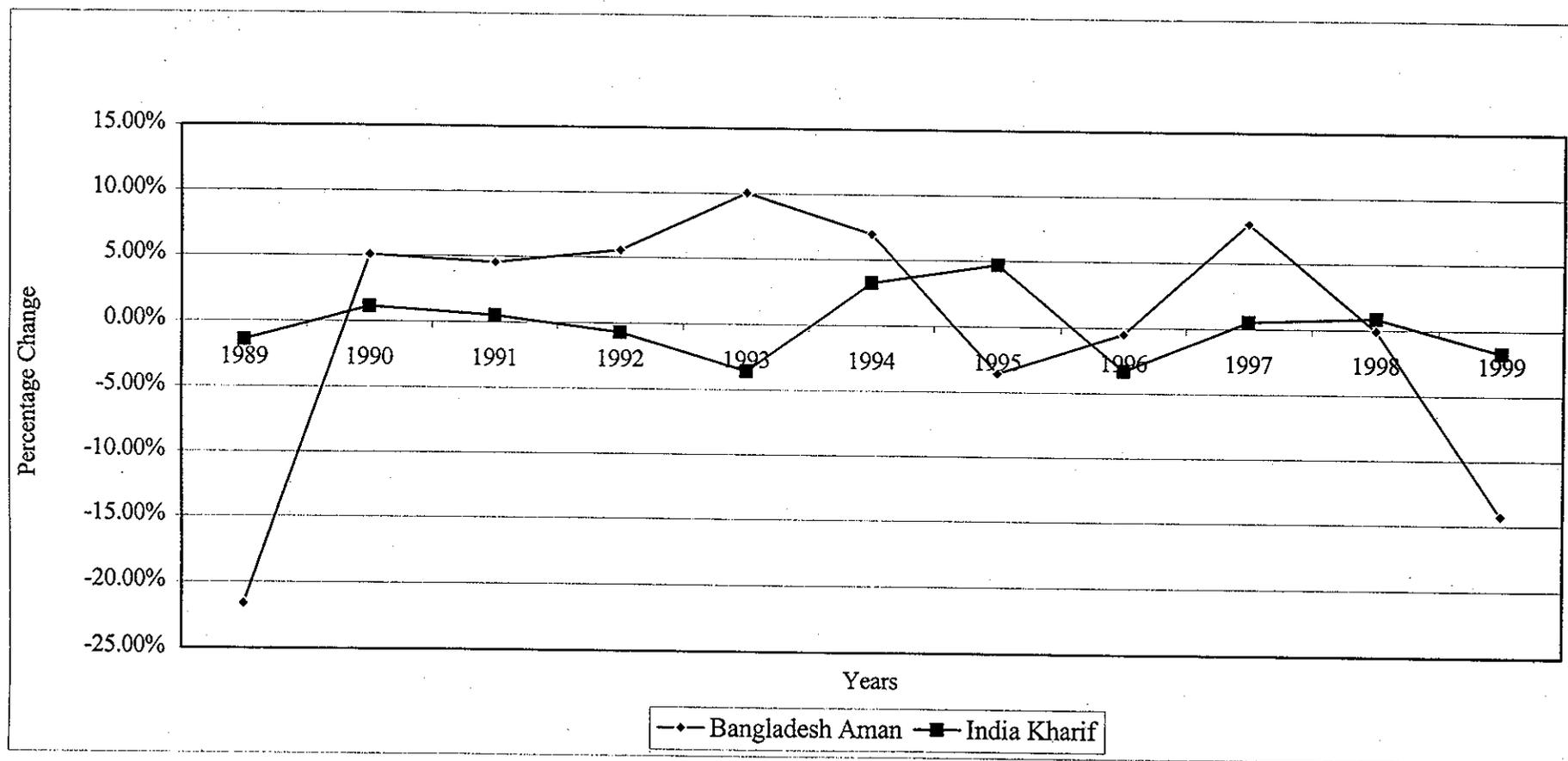


Figure 4.2 — Total Production of Aman Rice in Bangladesh and Kharif Rice in India, 1989-99 (Percentage Deviation from Trend)



below trend. India also experienced three years of substantial kharif rice production shortfalls below trend in the 1980s, 1982/83 (-17.40 percent), 1986/87 (-6.49 percent) and 1987/88 (-16.41 percent). In only one year of the 19 year period since 1980/81, did both India and Bangladesh have a bad aman / kharif crop in the same year (1986/87). Since that year, India's kharif rice production has been above or only slightly below trend, and in the two most recent years of very low aman harvests in Bangladesh (1988/89 and 1998/99), India's kharif production has been 5.50 percent above and 3.49 percent below trend (Figure 4.2).

Past trends are of course, not a perfect predictor of the future. But the lack of correlation between poor Indian harvests and poor Bangladesh harvests has an agronomic basis. India's kharif rice production is spread over a much wider area than Bangladesh aman rice production, so weather effects are likely to vary more across India's kharif rice producing zone, reducing the risk of weather-related failure to the entire crop. In particular, high rainfall or excessive snow melt in the Himalayas that cause flooding in Bangladesh and parts of eastern India does not necessarily correlate with poor weather in other regions of India.

In spite of the low correlation of production shortfalls, it is nonetheless prudent for the Bangladesh government to be prepared for such an occurrence. In such a situation, rice imports would likely have to come mainly from Thailand at somewhat high costs than imports from India, fewer private traders will be involved, and shipping schedules and problems at Chittagong port might hinder the smooth arrivals of rice imports.

## 5. IMPLICATIONS FOR BANGLADESH FOOD POLICY

This paper documents the important contribution private food imports have made to national food security in Bangladesh since the liberalization of the rice trade in early 1994. Following major production shortfalls in late 1998 and again in the second half of 1999, Bangladesh domestic rice prices rose rapidly to levels equal to import parity with India, providing the financial incentives for several million metric tons of rice imports. By encouraging this trade, the Government of Bangladesh was able to augment domestic rice supplies quickly and stabilize market prices.

Several key aspects of private sector imports from India enabled them to make this large contribution to national food security in Bangladesh in 1998 and 1999. First, India's good harvests and ample rice stocks made large-scale exports not only possible, but actually welcome for India. Second, the private sector trade was competitive, involving many hundreds of traders importing small quantities of rice. Third, the Government of Bangladesh gave the private sector clear signals that it supported this trade, removing all tariffs and surcharges on rice imports and instructing customs officials to expedite clearance of rice imports, particularly following the floods in mid-1999. Finally, Bangladesh had ample foreign exchange reserves and access to lending to pay for rice imports, (unlike during the 1974 famine when shortages of foreign exchange severely constrained the government's ability to import).

These factors may not necessarily be in place if major shortfalls in Bangladesh production occur in the future. Though historical evidence suggests a low correlation of Indian and Bangladesh rice harvests, it is possible that both countries could suffer shortfalls in the same year. Also, public food grain stocks in India are not likely to be substantially above target levels, as they have generally been in the late 1990s. If imports from India are not available, then Thailand becomes the likely next lowest cost of supply

for Bangladesh importers, implying a higher import parity price and a sharp reduction in the number of importers participating in the trade. Government support of the private import trade, though still necessary, might not be as forthcoming.

Moreover, the success of private rice imports in stabilizing prices and augmenting supplies in recent years in no way implies that less attention should be devoted to encouraging domestic production through appropriate price incentives and public investments, ensuring supplies of inputs, and agricultural research and extension. Chronic food deficits, if a result of a stagnant agriculture and rural economy, might be supplied by private sector imports, but would likely be accompanied by increasingly large segments of the population living in poverty and without access to sufficient food.

The large expansion of rice trade between India and Bangladesh is also a reminder of the far-reaching consequences of macro-economic and trade policy reforms. India's exchange rate depreciation was a major factor in making Indian rice competitive in Bangladesh rice markets. The trade liberalizations in both countries were likewise necessary for large-scale trade to take place. For Bangladesh, a substantial appreciation of the real exchange rate, caused by domestic inflation in excess of the rate of nominal exchange rate depreciation,<sup>24</sup> could make Bangladesh a consistent importer of rice, as the import parity price of rice falls and sets a low ceiling on domestic prices. In the absence of offsetting trade policy (import tariffs), the resulting low real prices of agricultural goods could result in slow agricultural and rural economic growth.

Nonetheless, the most important lesson from the Bangladesh experience with private sector rice imports in recent years is that trade liberalization can enhance national food security. By providing an automatic mechanism to increase domestic supply and stabilize prices, the trade liberalization in Bangladesh helped to ensure availability of food grain and stabilize prices. Combined with targeted public distribution programs that enhanced the access to food by the poor, private sector imports helped prevent a food

crisis and saved government resources for future productive investments. Though increased food security may not be a primary objective of trade liberalization, the Bangladesh experience shows that the two can in fact be compatible.

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<sup>24</sup> In the late 1990s, Bangladesh carried out a managed float exchange rate policy, allowing the nominal exchange rate to depreciate gradually.

**Appendix Table 2.1 — Value of India's Non-Basmati Rice Exports by Destination, 1992/93 - 1998/99**

	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	Average 1995/96-1998/99
World	17,496	22,546	34,047	371,741	192,472	168,538	433,455	291,552
Bangladesh	0	0	8,869	95,005	14,529	35,993	221,022	91,637
South Africa	0	9	136	30,402	18,931	24,355	51,515	31,301
Nigeria	0	0	0	2	1,013	11,915	22,039	8,742
Cote d'Ivoire	0	0	0	9,847	311	92	15,848	6,525
Saudi Arabia	2,009	5,587	9,084	11,533	25,380	10,574	15,026	15,628
Russia	190	0	144	10,558	31,750	15,358	14,064	17,933
Somalia	0	39	104	701	8,059	6,309	11,198	6,567
UAE	1,463	4,360	1,236	10,964	8,180	6,120	8,073	8,334
Mali	0	0	0	1,186	0	0	7,037	2,056
Iran	680	4,072	571	9,965	6,530	3,919	6,947	6,840
Senegal	739	0	420	9,330	3,532	5,478	6,595	6,234
Philippines	0	0	0	4,805	5,884	0	5,495	4,046
Yemen	2	0	0	2,739	2,025	5,478	3,765	3,502
Kenya	234	10	3,973	30,577	6,552	290	3,692	10,278
Malaysia	2,749	0	0	84	4	6	3,181	819
Benin	0	0	0	938	0	589	2,103	908
Poland	161	0	0	1,870	1,158	232	2,096	1,339
Singapore	30	729	978	635	786	1,901	2,048	1,343
Mauritius	0	0	469	893	2,756	0	1,888	1,384
Indonesia	0	0	1,389	83,182	46	0	1,864	21,273
Japan	5	3	0	295	2	414	1,863	644
Seychelles	0	0	0	259	125	240	1,856	620
Morocco	0	0	0	287	12	2,284	1,833	1,104
Sri Lanka	2,091	2,326	214	6	19,220	12,654	1,723	8,401
Ukraine	0	36	3	1,142	1,921	3,277	1,590	1,983
Tanzania	956	9	0	2,204	833	293	1,557	1,222
Angola	535	0	0	2,110	979	0	1,475	1,141
South Korea	0	0	0	5,424	72	224	1,320	1,760
Gambia	0	0	0	136	0	0	1,198	334
Others	5,652	5,366	6,457	44,662	31,882	20,543	13,544	27,658
Sub-Total Africa <sup>a</sup>	2,464	67	5,102	88,872	43,103	51,845	129,834	78,414
Share of Total Export (%)								
Bangladesh	0.0	0.0	26.0	25.6	7.5	21.4	51.0	26.4
Africa <sup>a</sup>	14.1	0.3	15.0	23.9	22.4	30.8	30.0	26.8
Others named above	53.6	75.9	40.0	38.5	53.5	35.7	15.9	35.9
Others	32.3	23.8	19.0	12.0	16.6	12.2	3.1	11.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Note: <sup>a</sup> includes Mauritius and Seychelles

Source: CMIE, 1999

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The FMRSP is a 3.5 year Project of the Ministry of Food, Government of the People's Republic of Bangladesh, providing advisory services, training and research, related to food policy. The FMRSP is funded by the USAID and is being implemented by the International Food Policy Research Institute (IFPRI) in collaboration with the Food Planning and Monitoring Unit (FPMU) of the Ministry of Food, the Bangladesh Institute of Development Studies (BIDS), the University of Minnesota and International Science & Technology Institute (ISTI).

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