

Report No. 9641-BD

# Bangladesh

## Food Policy Review: Adjusting to the Green Revolution

(In Two Volumes) Volume I: Main Report

February 28, 1992

Country Operations  
Industry and Finance Division  
South Asia Region I

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CURRENCY EQUIVALENTS

The external value of the Bangladesh Taka (Tk) is fixed in relation to a basket of reference currencies, with the US Dollar serving as the intervention currency. The official exchange rate on January 1, 1992 was Tk 38.80 per US Dollar.

US\$ 1 = Tk 38.80  
Tk 1 = US\$ 0.0258

WEIGHTS AND MEASURES

1 maund = 0.0373 metric ton (MT)  
1 long ton = 1.016 metric ton (MT)

FISCAL YEAR (FY)

July 1 - June 30

List of Abbreviations and Acronyms Used

ADP	-	Annual Development Program
BADC	-	Bangladesh Agricultural Development Corporation
BARC	-	Bangladesh Agricultural Research Corporation
BARI	-	Bangladesh Agricultural Research Institute
BBS	-	Bangladesh Bureau of Statistics
BIDS	-	Bangladesh Institute of Development Studies
BRDB	-	Bangladesh Rural Development Board
BRI	-	Bangladesh Rice Research Institute
CARE	-	Cooperative for American Relief Everywhere
CIDA	-	Canadian International Development Agency
CIF	-	Cost, Insurance and Freight
CSD	-	Central Storage Depot
CV	-	Coefficient of Variation
DGF	-	Directorate General of Food
DGMEI	-	Directorate General of Monitoring, Evaluation & Inspection
DRC	-	Domestic Resource Cost
DRR	-	Directorate of Relief and Rehabilitation
DTW	-	Deep Tubewell
EP	-	Essential Priorities
EPC	-	Effective Protection Coefficient
FFW	-	Food-for-Work
FFYP	-	Fourth Five-Year Plan
FM	-	Flour Mills
FOB	-	Free on Board
FS	-	Free Sales
GDP	-	Gross Domestic Product
GOB	-	Government of Bangladesh
GR	-	Gratuitous Relief
HES	-	Household Expenditure Survey
HYV	-	High-Yielding Variety
IFPRI	-	International Food Policy Research Institute
IMED	-	Implementation, Monitoring and Evaluation Division
IPP	-	Integrated Poultry Program
KCAL	-	Kilocalories
LE	-	Large Employers
LGEB	-	Local Government Engineering Board
LLP	-	Low-lift Pump
LSD	-	Local Storage Depot
MLG	-	Ministry of Local Government, Rural Development & Cooperatives
MO	-	Marketing Operation
MOF	-	Ministry of Food
MP	-	Muriate of Potash
MRR	-	Ministry of Relief and Rehabilitation
NEV	-	Net Economic Value
NPC	-	Nominal Protection Coefficient
OMS	-	Open Market Sales
OP	-	Other Priorities
PFDS	-	Public Foodgrain Distribution System
PR	-	Palli Rationing
RMP	-	Rural Maintenance Program
SIFAD	-	Strengthening the Institutions for Food Assisted Development

SR - Statutory Rationing  
STW - Shallow Tubewell  
TR - Test Relief  
TSP - Triple Super Phosphate  
UMR - Usual Marketing Requirement  
USAID - United States Agency for International Development  
VGD - Vulnerable Group Development  
WFP - World Food Program

TITLE: FOOD POLICY REVIEW: ADJUSTING TO THE GREEN REVOLUTION

COUNTRY: BANGLADESH

REGION: SOUTH ASIA COUNTRY DEPARTMENT I

SECTOR: Country Economic

<u>REPORT:</u>	<u>TYPE</u>	<u>CLASSIF</u>	<u>MM/YY</u>	<u>LANGUAGES</u>
9641-BD	ERA	Restricted	03 92	English

PUBDATE: 9203

ABSTRACT: Few countries approach food security with as much a sense of urgency as Bangladesh. An estimated 10 to 15 percent of the population is at severe nutritional risk, while the majority of the population faces hunger, deprivation and seasonal food insecurity. Government food policy, through its impact on prices and trade, seeks to ensure an affordable food supply for poor consumers while simultaneously providing adequate pricing incentives for agricultural production. This is a delicate balance which must be adjusted to take into account changes brought about by social and economic development. In the past twenty years, Bangladesh has witnessed dramatic changes in its agricultural production environment. Dissemination of Green Revolution technology has substantially reduced yearly and seasonal fluctuations in domestic foodgrain production, and consequently, reduced the variability of foodgrain prices. Declining production costs have made possible a decline in the real price of rice in Bangladesh--the ultimate goal of the Green Revolution. At the same time, the private foodgrain market--despite pockets of underdevelopment and isolation--has become well-integrated and efficient. The need for Government to intervene directly in the market to ensure food supply has been markedly reduced. This report suggests that the time has come to allow the private sector to play a larger role in stabilizing foodgrain prices and ensuring food security. The public sector can then work more effectively and efficiently to respond to catastrophic events such as cyclones and floods, and to target assistance to those at greatest nutritional risk. A medium-term policy framework is proposed to achieve these goals, and it calls for, inter alia, i) abolition of past restrictions on private sector domestic trade, transport and storage of foodgrains; ii) liberalization of external trade in foodgrains, and use of exchange rate and/or tariff policy to provide an appropriate level of effective protection for the domestic rice market; iii) adoption of a trade-based price stabilization mechanism which relies on private sector trade and a public sector import/export stabilization fund to keep rice prices within an acceptable range; iv) phasing out of ration channels which either target relatively well-off groups or which fail to effectively target the poor; v) expansion and diversification of self-targeting distribution programs, to offer a range of activities which reach more women and children during periods of low food availability and high incidence of disease; and vi) greater government accountability for food aid and financial flows, and improved efficiency of government food operations.

## BANGLADESH

### FOOD POLICY REVIEW : ADJUSTING TO THE GREEN REVOLUTION

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This report was prepared by Ellen Goldstein (Economist) on the basis of two economic missions to Bangladesh in July and November 1990. Background papers were prepared by the following individuals: J. Metzel, M.M. Dey, S. Zohir (profitability analysis); J.D. Stryker (price stabilization); S. Nizamuddin, G. Mohiuddin (efficiency of food operations); R. Heimendinger, N. Bond (rice export feasibility). Clerical support was provided by P. Lehaney.

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COUNTRY DATA - BANGLADESH

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<b>AREA</b> 148,998 km <sup>2</sup>	<b>POPULATION (1980)</b> 107 million Rate of Growth: 2.1	<b>DENSITY</b> 741 per km <sup>2</sup> of total area (1990) 1,087 per km <sup>2</sup> of cultivable land (1987)
<b>POPULATION CHARACTERISTICS (1988)</b>		<b>HEALTH (1988)</b>
Crude Birth Rate (per '000)	38.0	Population per physician: 5,210
Crude Death Rate (per '000)	14.0	Population per hospital bed: 3,204
Infant Mortality (per '000 live births)	110	
<b>INCOME DISTRIBUTION (1989)</b>		<b>DISTRIBUTION OF LAND OWNERSHIP (1978)</b>
% of national income, highest quintile:	48	% owned by top 10% of owners: 49
% of national income, lowest quintile:	7	% owned by smallest 10% of owners: 2
<b>ACCESS TO PIPED WATER (1985)</b>		<b>ACCESS TO ELECTRICITY (1981)</b>
% of population - urban:	24	% of population - urban: 3.5
% of population - rural:	49	% of population - rural: ..
<b>NUTRITION (1988)</b>		<b>EDUCATION</b>
Calorie Intake as % of requirements:	84	Adult literacy rate: 38%
Per capita protein intake (grams/day):	42	Primary school enrollment: 62%

GNP PER CAPITA IN 1990: US\$190 a/

	<u>GROSS DOMESTIC PRODUCT (1990/91)</u>		<u>ANNUAL RATE OF GROWTH (% , constant prices)</u>		
	<u>US\$ Million</u>	<u>%</u>	<u>FY75-80</u>	<u>FY81-86</u>	<u>FY87-91</u>
GDP at Market Prices	22,834	100.0	7.5	5.2	4.0
Gross Domestic Investment	2,838	11.6	0.1	..	..
Gross National Savings	1,864	7.4	..	..	..
Current Account Balance	974	4.3	...	...	..
Exports of Goods, fob	1,692	7.5	4.7	4.2	10.5
Imports of Goods, c.i.f.	3,470	15.3	6.2	1.8	2.8

OUTPUT IN 1990/91 BY SECTOR

	<u>Value Added</u> b/		<u>Labor Force</u> c/		<u>V.A. Per Worker</u> d/	
	<u>US\$ Mill</u>	<u>%</u>	<u>Mill</u>	<u>%</u>	<u>US\$</u>	<u>%</u>
Agriculture	8,056	35.6	32.6	65	247	55
Industry	3,718	16.4	7.8	16	477	106
Services	10,860	48.0	9.8	19	1108	245
Total	22,834	100.0	50.2	100	451	100

CENTRAL GOVERNMENT FINANCE

	<u>(Take Million)</u>		<u>% of GDP</u>	
	<u>FY91</u>	<u>FY88</u>	<u>FY88</u>	<u>FY91</u>
Current Revenue	78.22	8.8	9.9	
Current Expenditure	73.10	8.6	8.8	
Current Surplus	5.12	2.2	1.1	
Capital Expenditure	61.21	13.3	6.9	
External Assistance (net)	53.17	9.8	6.6	

- a/ World Bank Atlas methodology; base 87-89  
b/ At market prices.  
c/ Civilian labor force; 1989/90 data.  
d/ 1989/90 data.  
.. = Not available.  
... = Not applicable.

COUNTRY DATA - BANGLADESH

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<u>MONEY, CREDIT AND PRICES</u>	<u>June 83</u>	<u>June 84</u>	<u>June 85</u>	<u>June 86</u>	<u>June 87</u>	<u>June 88</u>	<u>June 89</u>	<u>June 90</u>	<u>June 91</u>
	(Billion Taka outstanding, end of period)								
Money and Quasi Money	59.0	83.9	105.3	123.4	138.5	164.1	190.8	223.0	250.9
Bank Credit to Public Sector	44.4	50.0	55.7	65.1	64.0	65.3	63.6	70.2	75.5
Bank Credit to Private Sector	31.0	49.1	68.2	83.6	89.6	109.0	133.6	160.1	178.2

(Percentages or Index Numbers)

Money and Quasi-Money as % of GDP	20.5	24.0	25.3	26.7	25.7	27.5	28.9	30.2	31.1
General Price Index (1970=100)	325.9	367.5	398.6	436.0	481.2	536.0	578.9	632.7	689.3
Annual Percentage Changes in:									
General Price Index	9.9	9.7	10.9	9.9	10.4	11.4	8.0	9.3	9.0
Bank Credit to Public Sector	-1.1	12.6	11.4	16.9	-1.7	1.7	-2.6	10.4	7.6
Bank Credit to Private Sector	31.3	58.4	40.3	21.3	7.2	21.5	22.6	19.8	11.3

BALANCE OF PAYMENTS  
(US\$ Million)

	<u>1980/81</u>	<u>1990/91</u>
Exports of Goods, fob	711	1,692
Imports of Goods, c&f	-2,533	-3,470
Trade Gap (deficit = -)	-1,822	-1,778
Non-Factor services, net	38	-78
Worker's Remittances	379	764
Other Factor Payments (net)	-23	-36
Current Account Balance	-1,428	-974
Direct Foreign Investment	-	-
Net MLT Borrowing	503	685
(Disbursements)	553	901
(Amortization)	50	216
Capital Grants	594	832
IMF facilities, net	193	4
Other Capital, net	162	-168
Change in Reserves (- = increase)	24	381
Gross Reserves (end of year)	251	966

RATE OF EXCHANGE (March , 1992)

US\$1.00 = Taka

MERCHANDISE EXPORTS (1990/91)

	<u>US\$ Million</u>	<u>%</u>
Raw jute	104	6
Jute goods	290	17
Tea	48	3
Leather	137	8
Fish and shrimps	142	8
Garments	869	51
Others	107	7
Total	1,692	100

EXTERNAL DEBT, June 1991

	<u>US\$ Million</u>
Public Debt, incl. Guaranteed	
Private Debt	11,392
Non-Guaranteed Private Debt	..
Total Outstanding and Disbursed	11,392

DEBT SERVICE RATIO FOR 1990/91 a/

	<u>%</u>
Public Debt, incl. Guaranteed	
Private Debt	22.7
Non-Guaranteed Private Debt	..
Total	22.7

IBRD/IDA LENDING, June 1991 (US\$ Million)

	<u>IBRD</u>	<u>IDA</u>
Outstanding and Disbursed	59.6	4,035.0
Undisbursed	0.0	1,857.4
Outstanding incl. Undisbursed	59.6	5,892.4

a/ Including IMF  
.. = not available.

## EXECUTIVE SUMMARY

### The Goal: Food Security

i. Few countries approach food security with as much of a sense of urgency as Bangladesh. The country has an average per capita income of less than US\$ 200, a population density of nearly 800 inhabitants per square kilometer, and a history of periodic flood, famine and drought. In recent years, with modest income growth and rapid urbanization, Bangladeshis have begun to diversify their diet away from foodgrains, and devote a larger share of their household budget to non-food items. Nonetheless, the average household still spends 60 percent of its budget on food, and foodgrains still supply 80 percent of caloric and 60 percent of protein intake. The poorest decile of the population spends 75 to 80 percent of its income on food, which consists almost exclusively of basic foodgrains. This group--the ultra poor--are likely to be at severe nutritional risk, while many more households--the majority, in fact--face hunger, deprivation and seasonal food insecurity. Anthropometric data indicate that two-thirds of Bangladeshi children sampled are chronically undernourished, as evidenced by widespread stunting, while 10 to 20 percent are acutely malnourished and at severe nutritional risk. Cultural attitudes and customs dictate that women eat least, and that sons are favored over daughters in terms of food quality, child care and health care. Women have low body weights by international standards, gain very little weight in pregnancy, and lose weight with each successive pregnancy in a cycle referred to as maternal depletion syndrome. The low health status of women impacts heavily on their children. One out of six pregnancies ends in foetal death, and 25 to 50 percent of babies are born at low birthweights, substantially increasing the risk of infant mortality. One out of eight babies dies before his/her first birthday, generally as a result of the nexus between malnutrition and infectious disease. Breaking this cycle of malnutrition and disease should be the primary goal of food policy.

ii. Recently, Bangladesh has made the transition to democratic government. With this transition comes the responsibility for government to be more responsive to the needs of the people, particularly the poor who lack the power to effect change. Nothing is as fundamental as food in Bangladesh, and nothing as sensitive as food policy. It is the goal of the Ministry of Food to ensure an affordable food supply for consumers, the goal of the Ministry of Agriculture to maintain adequate production incentives for farmers and the goal of the Ministry of Finance to see that these objectives are reached through an efficient use of budgetary resources. This is a delicate balance, which must be adjusted to take into account changes brought about by social and economic development. In the past twenty years--and particularly in the past decade--Bangladesh has witnessed dramatic changes in its agricultural production environment. Dissemination of Green Revolution technology has substantially reduced the yearly and seasonal fluctuations in domestic foodgrain production, and, consequently, reduced the variability of foodgrain prices. Declining production costs have made possible a decline in the real price of rice in Bangladesh--the ultimate goal of the Green Revolution. At the same time, the private foodgrain market--despite pockets of under-development and isolation--has become well-integrated and efficient. The need for Government to intervene directly in the market to ensure food supply has been markedly reduced.

iii. There is a growing recognition world-wide that the legitimate role of Government is to step in where markets fail, or when important equity issues are not being addressed. When the public sector supplants the functions of the private market, the result is often bureaucratic inefficiency, politically-motivated resource allocation and opportunities for corruption. This report suggests that the time has come to allow the private sector to play a larger role in stabilizing foodgrain prices and ensuring food security in Bangladesh. The public sector can then work more effectively and efficiently to respond to catastrophic events such as cyclones and floods, and to target assistance to those at greatest nutritional risk. A medium-term policy framework is proposed to achieve these goals, with policy recommendations falling into four broad categories: i) strengthening private sector trade; ii) adjusting the price stabilization mechanism; iii) targeting the food insecure; and iv) improving the efficiency of food operations.

### The Medium-term Policy Framework

#### Strengthening private sector trade

iv. All past restrictions on private sector domestic trade, transport and storage of foodgrains--including the ban on bank credit for foodgrain storage--should be permanently abolished to send a clear signal to the private sector that it has the primary role to play in stabilizing prices on a regional and seasonal basis. Many of these restrictions were suspended in FY90, but they have not been permanently abolished, and create a sense of uncertainty in the private sector which may discourage the transport, storage and trade needed for efficient market clearing and stabilization of domestic prices. In the past decade, use of external trade to compensate for fluctuations in domestic production has been limited by the Government's monopoly on foodgrain imports, which has restricted the flow of imports and resulted in higher domestic prices than would have prevailed in a free market. Shifting the responsibility for commercial importing to the private sector would have two advantages. First, the private sector tends to be more responsive to market signals and more efficient than the public sector bureaucracy, thereby avoiding the inflated prices and poor timing which plagued past Government imports. Second, under a liberalized trade regime, Government can rely on exchange rate policy and/or tariff policy to establish a level of protection in the domestic market that is consistent with sustained growth in agriculture. Profitability analysis of rice production in Bangladesh indicates that the current level of market protection is unnecessarily high, forcing consumers to pay more for rice than they need to. Given the dominance of rice in the consumption pattern of the poor, and the country's limited capacity to implement targeted distribution programs, it is undeniable that lowering the price of rice in the domestic market would be the most effective way to improve the welfare of the poor. Coordinated trade liberalization and exchange rate movement could bring this about. Liberalization accompanied by moderate import tariffs would be a second-best means of reducing the level of protection in the rice market, but Bangladesh would lose the general export promotion effect gained through depreciation of the real effective exchange rate.

v. Trade liberalization coupled with reduction of market protection for rice will be of great benefit to consumers, and can be absorbed by a rice sector in which production costs are declining due to technological change and

liberalization of input markets. As rice production expands, domestic rice prices will fall toward world prices. This is to be expected, and provides an appropriate signal to diversify agricultural production and/or export rice. Liberalizing trade today will establish a necessary link between the domestic rice sector and the world market. World price trends will then serve as an efficiency benchmark for the rice sector--ensuring the development of an efficient sector which may one day be capable of exporting rice profitably.

vi. Bangladesh should also continue to rely on imports to fulfill the growing domestic demand for wheat. Profitability analysis for wheat indicates that only limited parts of the country have the necessary climatic and soil conditions for efficient production. This has important implications for both trade and food policy. On a macro-level, policies which would distort incentives in favor of large-scale wheat production would be a costly and inefficient use of resources. The country is better off promoting crops which can be produced efficiently (such as rice), and relying on imports to overcome the wheat deficit. Given balance of payments constraints, a continued reliance on food aid to fulfill a large portion of wheat demand makes sense.

#### Adjusting the price stabilization mechanism

vii. The current stabilization mechanism relies on Government procurement and open market sales to keep market prices within an official price band. However, in its present form, this buffer stock mechanism has been largely ineffective in achieving its stabilization goals, as well as economically inefficient and extremely costly to the budget. Its inefficiency lies not in its distortion of market prices, but rather in its: i) creation of a two-tiered pricing structure that induces rent-seeking behavior; ii) bureaucratic inefficiency in importing, handling and transporting foodgrains; and iii) implementation of financially unsustainable pricing policies which have the potential to discourage private sector foodgrain storage and trade. As a medium-term alternative, the Government may wish to consider adopting a trade-based mechanism for price stabilization. Such a mechanism would rely on private sector trade and a public sector import/export stabilization fund to subsidize/tax trade as necessary to keep domestic prices within an acceptable price band. The advantage of such a mechanism is that it is capable of stabilizing prices as effectively as a well-functioning buffer stock system, but it is vastly more efficient and less costly to operate. Its greater economic efficiency lies in its link to external trade and world market prices, which will keep the official price band in line with the long-run opportunity cost of rice. Its greater operational efficiency is due to the reliance on the private sector for most trade and marketing, while direct Government procurement would be limited to that necessary to supply targeted distribution programs. All Government procurement and open market sales would be conducted at market prices, rather than official prices, to eliminate the existing two-tiered pricing system. Budgetary cost would be greatly reduced relative to the current buffer stock scheme because Government would avoid the physical costs of handling foodgrain, reduce subsidization through realignment of the official price band and earn interest on reserves held in the stabilization fund.

viii. In the short-term, action must be taken to correct unsustainable aspects of the current buffer stock system. In recent years, the official price

band has drifted upward relative to the declining trend in the real price of rice. To correct this, Government needs to contain nominal increases in the procurement price. There is also an urgent need to restore a reasonable margin between the procurement price (i.e. the floor price) and the OMS price (i.e. the ceiling price). A margin of at least 20 percent is recommended, both to encourage private sector storage and to help defray the Government's own storage and handling costs. Inefficient procedures which have no impact on producer or consumer prices should be stopped. In particular, millgate paddy purchase and payment of milling fees by Government should be eliminated in favor of open tenders for milled rice in procurement zones. Finally, Government should procure only to fulfill the legitimate needs of distribution programs. Open-ended procurement--predicated on price support and linked to poorly targeted rationing channels--has proven to be an open invitation for abuse.

#### Targeting the food insecure

ix. Untargeted interventions to reduce the price of rice in the domestic market have the most far-reaching consequences for the welfare of the poor in Bangladesh. However, untargeted interventions need to be supplemented with mechanisms for targeting particularly vulnerable groups, in order to enhance their food security. In the FY85-91 period, less than half of Bangladesh's public food resources were channeled toward the poor. To remedy this, ration channels which target relatively well-off groups, such as urban civil servants, need to be phased out. These channels have provided little economic benefit to their recipients in recent years, and merely inflate PFDS operating costs. While they do serve to generate net revenues on sales of food aid wheat, this revenue generation could be more efficiently carried out through direct monetization of food aid in the wholesale market. The palli rationing channel--ostensibly targeted toward the poor--should also be phased out. Reviews of palli rationing have found the channel to be fraught with abuse in both the selection of recipients and the pricing of rations. Since FY90, the channel has been the primary means for disposal of domestically procured rice, and, increasingly, has served as a justification for continued high levels of domestic procurement even when domestic market prices are high.

x. Self-targeting programs (i.e., programs which require the active participation of beneficiaries) need to be expanded and diversified, to offer a range of activities which reach more women and children, particularly during periods of low food availability and high incidence of disease. Self-targeting programs--of which Food-for-Work (FFW) is the largest--have focused too much of their activity on construction of rural infrastructure, thereby favoring male participation and distributing the majority of their food resources during the dry season, when food availability and demand for agricultural labor is relatively high. Recent attempts by donors to diversify FFW into year-round activities with high female participation should be encouraged and accelerated.

xi. Medium-term diversification of food-for-work programs is also necessary to allow upazillas to choose activities which have a high economic or social payoff. In FY90, 70 percent of FFW resources was allocated to the upazilla-based Local Initiatives scheme, predominantly for construction of rural roads and associated structures. However, this program has contributed only to the development of an excessively long network of poorly constructed, inadequately maintained

earthen roads which are of little or no economic value. In addition, insufficient attention has been paid to the negative consequences of this program, including the uncompensated appropriation of land, destruction of trees and disruption of natural drainage patterns. In the short-term, a restructuring of incentives for rural road building is essential, in order to emphasize the completion and maintenance of economically-viable alignments. In the longer-run, all efforts should be made to diversify FFW activities.

xii. Since FY90, major food aid donors have begun shifting FFW resources into alternative activities such as development of fish ponds and tree planting. These initiatives are encouraging, but remain a small portion of total FFW resources. Large-scale diversification will require input from sectoral ministries, integration of food resources into the planning process for the Annual Development Program and implementation of the institutional changes recommended in the SIFAD report.<sup>1/</sup> More food aid should be monetized, as well, to provide more efficient, cash-based income transfers, redress the imbalance between food and financial resources and reduce the operational costs of handling foodgrain. However, donor acceptance of increased monetization will depend critically on the Government's commitment to a reliable and transparent mechanism for monetization and transfer of counterpart funds, as well as to improved financial accountability for food resources.

#### Improving the efficiency of food operations

xiii. Food operations have been a financial drain on the Revenue Budget for more than a decade, generating no net budgetary savings with which to finance the Annual Development Program. However, food operations have the potential to generate such savings--or at least be self-financing--without jeopardizing the food security of the poor. Financial sustainability will depend most on the choice of policy mechanisms adopted, not on the efficiency with which they are implemented. Nonetheless, there is considerable scope for increasing the efficiency of Government food operations, even in the absence of more fundamental policy reform. This will require institutional reorganization and enhanced accountability for food and financial flows at all levels. Such changes have been under study since 1985 (within the Directorate of Food Reorganization Project), and should be approved and implemented without further delay. Establishment of financial and inventory accounting systems and modification of the Food Budget are necessary to permit accurate monitoring of the cash deficit on food operations.

xiv. Much can be done to increase the efficiency with which Government carries out its food operations. First, Government needs to withdraw from activities better handled by the private sector. This includes commercial importing of foodgrains (except in emergency situations); importing and distribution of non-essential commodities such as oil, sugar and salt; and industrial flour milling. Second, Government should pay competitive market prices for goods and services associated with food distribution. In recent years, Government has paid fixed rates for lightering of ships and road transport which are two to three times

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<sup>1/</sup> Strengthening the Institutions for Food-Assisted Development (SIFAD), 1987.

competitive market rates. There is a need to move toward unrestricted tendering and competitive bidding for the award of these contracts. Third, poor planning and stock management have resulted in excessive levels of rolling stock and excessive movement of foodgrain throughout the country. Reducing security stock requirements to an appropriate level, implementing a least-cost routing plan for foodgrain movement and rationalizing the geographic distribution of storage capacity would reduce costs and foodgrain losses.

#### Developing a Medium-term Vision

xv. The Government now has the opportunity to evaluate past policy in Bangladesh, and develop a vision of where food policy should go in the medium-term. The vision created in the aftermath of the 1943 famine may have served the country well in the latter half of the twentieth century, but it will not be sufficient to carry Bangladesh into the twenty-first century. The medium-term policy framework presented in this report reshapes food policy to render it both more effective and more financially sustainable, taking into account Bangladesh's significant progress toward achieving rice self-sufficiency and developing the private foodgrain market. It is hoped that this report will serve as a catalyst for discussion within Government, as well as between Government and food aid donors, and lead to the definition and implementation of a carefully-sequenced food policy reform program.

## CHAPTER I

### Introduction

1. Few countries approach food security with as much of a sense of urgency as Bangladesh. The country has an average per capita income of less than US\$ 200, a population density of nearly 800 inhabitants per square kilometer (three times that of neighboring India) and a history of periodic flood, famine and drought. In recent years, with modest income growth and rapid urbanization, Bangladeshis have begun to diversify their diet away from foodgrains, and devote a larger share of their household budget to non-food items. Nonetheless, the average household still spends 60 percent of its income on food, half of which is for basic foodgrains. Foodgrains (mostly rice) still provide an average of 80 percent of caloric intake and 60 percent of protein intake in Bangladesh. Consumption of fats and oils is among the lowest in the world, and vitamin and mineral deficiencies are widespread. The poorest decile of the population spends 75 to 80 percent of its income on food which consists almost exclusively of basic foodgrains. This group -- the ultra-poor -- are likely to be at severe nutritional risk, while many more households -- the majority, in fact -- face hunger, deprivation and seasonal food insecurity. Anthropometric data indicate that 80-90 percent of Bangladeshi children sampled are below average (as measured by the international reference median) in height-for-age and weight-for-height. Two-thirds sampled are chronically undernourished, as evidenced by widespread stunting, while 10-20 percent are acutely malnourished and at severe nutritional risk. Cultural attitudes and customs dictate that women eat least, and that sons are favored over daughters in terms of food quality, child care and health care. Women have low body weights by international standards, gain very little weight in pregnancy, and lose weight with each successive pregnancy in a cycle referred to as maternal depletion syndrome. The low health status of women impacts heavily on their children. One out of six pregnancies ends in foetal death, and 25-50 percent of babies are born at low birthweights, substantially increasing the risk of infant mortality. One out of eight babies dies before his first birthday, generally as a result of the nexus between malnutrition and infectious disease. Breaking this cycle of malnutrition and disease should be the primary goal of food policy.

2. The Government has espoused "food self-sufficiency" as a priority objective, interpreting this largely as a drive to achieve self-sufficiency in the production of rice. This interpretation is both sensible and economically justified. A broader interpretation risks the adoption of food policies which bear a high resource cost by promoting the production of crops for which the country has no comparative advantage. While policymakers rightly value the rural incomes generated, the increased domestic production and the greater degree of security inherent in "food self-sufficiency", there is a point beyond which the production inefficiencies are too great and the opportunity cost of the resources lost is too high. Efficiency, however, doesn't necessarily produce a socially and politically acceptable distribution of income and food consumption, especially in a poor country such as Bangladesh. A progressive tax and transfer policy could redistribute income without affecting the relative prices which determine agricultural production decisions and investment behavior. However, this solution is one which policymakers--in Bangladesh and many other countries--have found difficult to implement. Instead, the Government of Bangladesh has chosen to adopt policies which alter the relative prices of food to meet the often competing needs of both producers and consumers. This set of food

policies, through its impact on prices and trade, simultaneously seeks to ensure access to an affordable food supply for poor consumers while providing adequate pricing incentives to domestic producers.

3. In pursuit of these objectives, the Government maintains an extensive public foodgrain distribution system which engages in rationing and disaster relief, as well as purchases and sales in the domestic market to stabilize foodgrain prices. There are currently more than a dozen ration channels, with varying subsidy rates, targeted not only to the poor, but also to relatively well-off consumer groups such as civil servants. A large portion of the distribution to the poor is in the form of seasonal Food-for-Work or other development schemes; the other channels operate year-round, and include not only foodgrain (rice and wheat), but sugar, salt and edible oil. Distribution through rationing channels is about ten times the volume of open market sales for price stabilization, and occurs even at times, and in places, where the Government is procuring domestic production to support producer prices. Government intention with respect to price stabilization is to intervene in the market at predetermined ceiling and floor prices in order to: i) protect poor consumers from sharp increases in the price of their staple commodity; ii) protect poor farmers from post-harvest collapses in producer prices; and, iii) encourage surplus production to achieve national foodgrain self-sufficiency. In practice, the Government has been more successful at keeping prices at or below the ceiling, through both open market sales and rationing, than at maintaining a floor price through procurement. This is because procurement in the past has been used mainly to fulfill the needs of the distribution program, rather than as a price support mechanism.

4. Both domestic and international foodgrain trade are subject to market regulation. Export of foodgrains is prohibited, and the Government maintains a monopoly on importing. In recent years, between 1.0 and 2.5 million MT of food aid, mostly wheat, have been imported annually, along with commercial imports of rice and wheat ranging from 50,000 to 800,000 MT. The decision to import is based on an assessment of domestic production and an estimation--often subject to considerable debate--of the remaining supply gap in the domestic market. At times, import policy has drawn heavy criticism for being insufficiently sensitive to changing market conditions. Food aid commitments and arrivals have not always reflected prevailing supply conditions, and indiscriminate commercial importing, often at inflated prices, has drained scarce budgetary resources and placed downward pressure on prices at times when the Government has been actively procuring in the domestic market to support producer prices. Also under fire have been long-standing Government restrictions on foodgrain storage and transport by private traders (the "anti-hoarding" laws), as well as the prohibition against extending bank credit for foodgrain storage. Many of these restrictions, which were intended to prevent private sector speculation and hoarding in times of shortage, have been only sporadically enforced, and were suspended following four abundant harvests in 1989 and 1990. Nonetheless, they have not been permanently abolished, and create a sense of uncertainty within the private sector that discourages the trade, transport and storage needed for efficient market clearing and stabilization of domestic prices.

5. The evolution of food policies and programs in Bangladesh has been chronicled in numerous reports through the years.<sup>1/</sup> There are, however, a number of reasons why it is important now, at this stage in the country's development, to review the existing policy framework. First, the adoption of irrigation technology and high-yielding rice varieties in the past decade has had a profound impact on aggregate production levels, the stability of per capita production, the yearly production cycle, and the resulting pattern of seasonal price fluctuation. Most recently, this rapid technological change, coupled with liberalization of agricultural input markets and favorable flooding conditions has led to dynamic growth in rice production. In FY90 and FY91, Bangladesh experienced record levels of rice production, leading to claims that the country had achieved rice self-sufficiency for the first time. This laudable achievement raised questions, however, about the sustainability of increases in rice production, and the appropriate policy environment as Bangladesh approaches self-sufficiency in rice. Although future production will continue to fluctuate with the vagaries of climate and floods, this fluctuation may be between a surplus and a deficit position, in contrast to the chronic deficits of the past. Government and food aid donors will need to respond flexibly to more rapidly changing supply conditions. Policies which may have been appropriate within the context of chronic deficits will need to be reviewed. It may be that the goals of stabilizing producer and consumer incomes and enhancing nutritional status could now be better served through a liberalized trade regime, increased competitiveness of the domestic market, agricultural diversification and more effective tax and transfer mechanisms.

6. The second reason to undertake a food policy review at this juncture is because food operations in recent years have become a major drain on Government resources and a source of financial instability. The situation deteriorated dramatically in FY90, when the deficit on the food account (on a commitment basis) rose to Tk 11 billion--or 15 percent of budgetary revenues--due to excessive commercial importing, an unexpectedly high volume of domestic procurement and inefficiencies in food stock management. The Government responded to the unprecedented level of rice production in FY90 by locally procuring more than 900,000 MT, or nearly three times the volume of previous years. At the same time, 260,000 MT of rice were commercially imported, despite the favorable production situation. As a result, public sector rice stocks rose to twice the average year-end level by end-FY90. With good harvests in early FY91, rice prices in the domestic market did not experience enough of a seasonal upswing to allow the Government to sell rice at a price that covered costs. The quality of public sector rice stocks deteriorated rapidly due to inadequate post-harvest drying, eliminating the possibility of exporting excess stocks, and undermining their nutritional value in targeted rationing programs. Relatively low market prices and reductions in subsidy rates made ration sales sluggish in many channels, and the Government and donor community had to institute emergency measures in early FY91 to liquidate public stocks and minimize budgetary losses in ways that were least disruptive to the domestic market. The second half of FY91 was a time of political and economic uncertainty as a result of the Gulf Crisis and Bangladesh's transition to democratic government. Rice prices firmed

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<sup>1/</sup> The last World Bank report on food policy, entitled Bangladesh: Food Policy Issues (Report No. 2761-BD) was issued in December, 1979.

up in the domestic market, facilitating the liquidation of Government rice stocks, lowering the level of domestic procurement and reducing budgetary losses on food operations. Pressure from the donor community curbed the Government's appetite for commercial importing of foodgrains, and this measure, more than any other, helped reduce the deficit on the food account to around Tk 3.5 billion in FY91. A deficit of a similar magnitude is projected for FY92 as Government continues to engage in high levels of domestic procurement regardless of prevailing prices in the domestic market. Thus, while there is an expectation that food operations in Bangladesh should be a source of budgetary savings to finance public investment, instead they have become a seemingly permanent drain on the Revenue Budget. At this point, it is crucial for Government and the donor community to examine food policies in light of the changing production environment, and consider reforms that would make food operations in Bangladesh financially self-sustainable without jeopardizing the food security goals upon which they are predicated.

7. A third motivation for undertaking this food policy review is to stimulate discussion about the future role of food aid in Bangladesh. At issue is whether Bangladesh can sustain self-sufficiency in rice, and, if so, whether this can-- and should--be reconciled with continued reliance on food aid. Achieving self-sufficiency in rice at the aggregate level doesn't reduce the need for the budgetary assistance that food aid can provide, nor does it obviate the need to generate employment and transfer income (perhaps as food) to those who lack the purchasing power to fulfill their minimum consumption requirements. Government sales of food aid generate about one-fifth of the local currency resources earmarked for the public investment program (the Annual Development Program, or ADP). In recent years, weak fiscal performance coupled with unchecked growth of current expenditures has deprived the ADP of budgetary resources, and led to real declines in the level of public investment. Reductions in the volume of food aid would exacerbate this situation in the short-term. However, donors' continued willingness to supply aid in kind to support the ADP will depend on the country's capacity to efficiently monetize this aid, and channel the local currency to its proper destination in a timely and reliable manner. It is hoped that this review will focus attention on the need to generate additional local currency resources, through efficient monetization of food aid or substitution into other forms of commodity aid, as well as through more fundamental efforts at fiscal reform and public expenditure management. The future of food aid in Bangladesh also has important implications for the design and sustainability of food-based poverty alleviation and development activities. In recent years, efforts have been made to shift the focus of food aid programs away from short-term relief towards longer-term development activities. Of course, the country's history of famine, and persistent vulnerability to drought and flood, necessitate a highly-organized capability for disaster relief. However, the expansion of irrigated agriculture has mitigated the adverse impact of these natural disasters on food production, which may allow for more stability and long-run planning in the use of food aid in the future. If so, food aid must be integrated into the larger pool of development financing, and food-based programs must be subject to rigorous investment criteria for economic growth and social welfare.

8. A final reason to review food policy at this point in time is to build on the Government's recent experience with private sector provision of agricultural inputs, which has proven quite successful. It may prove equally beneficial to reduce public sector intervention in the processing, storage and marketing of agricultural output, as well. This review will try to identify those areas in which Government intervention is essential to achieve the growth and equity goals of food policy, and those areas which could be more efficiently handled by the private sector. South Asia as a whole has a history of substantial public sector intervention in the foodgrain market, but as economies develop and grow more complex, Governments need to focus first and foremost on those areas in which there are externalities or equity concerns which only the public sector can address.

9. The review that follows begins with a look at recent trends in food production and consumption patterns (Chapter II), as the basis for understanding the evolution of food supply and demand in the future. Chapter III then evaluates the impact of existing food policies on the incentives for food production and marketing, and examines the key variables that will determine foodgrain supply and demand in the medium-term. The structure of incentives is reviewed, and the financial and economic profitability of alternative crops is examined in order to answer questions about comparative advantage, rice self-sufficiency, the feasibility of rice exports and the scope for future crop diversification. Chapter IV explores the changing nature of rice price variability in Bangladesh, and the appropriateness of Government stabilization policy in light of these changes. Chapter V then evaluates targeted food programs, in terms of their impact on food security for the most vulnerable groups, and their contribution to economic development. Finally, Chapter VI will move beyond policy analysis to the realm of policy implementation and management of food operations. Discussion will focus on improving the efficiency, and ensuring the financial sustainability, of Government food operations through: (i) coherent policy formulation; (ii) regular food programming and budgeting; (iii) appropriate procurement processes; (iv) streamlined bureaucracy; (v) financial and operational accountability; (vi) increased reliance on the private sector, and (vii) better coordination of donor policies.

## CHAPTER II

### Recent Trends in Food Production and Consumption

#### The Production Environment

10. Bangladesh has a land area of 144,000 km<sup>2</sup> and a population of 114 million, giving it a population density of nearly 800 inhabitants/km<sup>2</sup>--the highest in the world. Agricultural activity accounts for approximately 44 percent of GDP, and employs nearly 60 percent of the labor force. However, the extremely high population density, coupled with a population growth rate of 2.4 percent per annum, has led to rapid urbanization, increasing landlessness and fragmentation of land holdings. Almost half the total population can be considered "functionally landless" (i.e. holding no land or less than 0.2 hectares per household), and the average size of farms has declined from 1.4 ha. in FY77 to 0.9 ha. in FY84.<sup>1/</sup> The small size of holdings has an extremely important implication for food policy: the vast majority of producer households are net consumers of basic foodgrains. They are "deficit producers", although they may still market a share of their output to fulfill immediate cash needs.

11. Bangladesh has a sub-tropical monsoon climate, with the rabi (dry) season, stretching from November through March and the kharif (rainy) season from April to October. The monsoon period is generally from July through October, and accounts for 80 percent of yearly rainfall, which ranges from 1200 to 3500 mm. The country is situated at the delta of three major river systems, so that most of the land is low and flat, with fertile, alluvial soils which are subject to periodic flooding. Three-fourths of the total area under cultivation is devoted to rice, which is grown in three cycles: aus and aman in the kharif season and boro in the rabi season. Jute production competes with aus, and, to a lesser extent, with boro, while sugarcane and cotton are grown year-round. High-yielding varieties (HYV) of boro are the principal crop in the rabi season, although wheat, pulses, oilseeds, tubers, vegetables and spices are also grown.

12. In the past twenty years, growth in crop production has been primarily due to intensification made possible through the introduction of irrigation technology and the dissemination of HYV seeds and chemical fertilizers. Cropping intensity increased from 133 percent in FY61-65 to 159 percent in FY87 as a result of irrigation expansion. Although the area under irrigation increased by only 54,000 ha per annum in the 1970-78 period, this accelerated to 95,000 ha per annum in 1978-88 (Table 2.1). An important shift in the choice of technology has also taken place. Tubewell technology--particularly low-cost shallow tubewells--not only led the expansion in irrigated area, but also substituted for traditional irrigation methods. Area under tubewells expanded by nearly 28 percent per annum in the 1978-88 period, or a yearly average of 134,000 hectares.

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<sup>1/</sup> 1983/84 Agricultural Census. The average size of paddy farms is actually smaller because farms in the hill tracts of Chittagong and Sylhet, which produce little or no rice, tend to be larger.

Table 2.1: Area under Irrigation, by Method, 1969/70 to 1988/89  
(000 Hectares)

	FY70	FY78	FY88	FY90
<u>Modern Methods</u>	357	744	2,108	2,534
Low-lift Pumps	300	554	527	658
BWDB Gravity Schemes	24	63	115	200
Tubewells	33	127	1,466	1,676
Shallow	..	..	868	1,046
Deep	..	..	554	593
Hand	..	..	44	37
Traditional Methods	725	770	353	400
Canals	291	120	115	174
Dhoons	392	397	..	..
Other	42	253	238	226
Total	1,082	1,514	2,461	2,934

13. Until 1988, the Bangladesh Agricultural Development Corporation (BADC) maintained a monopoly on the import and distribution of most irrigation equipment. In addition to raising the cost of equipment to farmers, this led to inefficient public investment in more expensive deep tubewells (DTWs), which remained heavily subsidized, in areas where shallow tubewells (STWs) would have sufficed. In 1989, the Government began liberalizing agricultural input markets, opening the equipment market to private sector importers and distributors. Market response was swift: area under irrigation grew at a record pace of over 230,000 ha. per annum in FY89 and FY90. Increased availability and lower purchase prices (by as much as 50 percent relative to BADC prices) both contributed to the success.

14. Eighty-five percent of irrigated area in Bangladesh is devoted to rice production, mostly HYV boro in the rabi season. Rapid expansion of irrigated area and HYV boro production allowed Bangladesh to maintain rice production levels despite severe flood damage to the aman crop in FY88 and FY89, and to achieve a record level of production (more than 18 million MT) in FY90. The expansion of irrigated area has clearly been the driving force behind increased use of chemical fertilizers and HYV seeds. In recent years, the Government has begun to take measures to liberalize the fertilizer market, reducing subsidy rates and privatizing the distribution of urea. However, production of all types of fertilizer, and import of most types is effectively subject to Government monopoly, with remaining price subsidies acting as a deterrent for private sector operations. As a result, lack of access to fertilizer is still a major constraint to improved productivity. Nonetheless, the measures to partially

liberalize the market have contributed to rapid growth of fertilizer consumption, even as subsidies have been reduced (Table 2.2). Rough estimates of fertilizer consumption indicate that farmers are now using, on average, only about 50-60 percent of the recommended dosage of urea and about 30 percent of the recommended dosage for TSP and MP, reducing productivity considerably. The market for improved seeds also remains under Government monopoly. BADC's seed multiplication programs provide a subsidy on improved seeds, but the monopoly on distribution, and five-year approval process for imported varieties, has unnecessarily limited availability and slowed the pace of HYV adoption.

Table 2.2: Fertilizer Consumption, FY71 to FY89 1/

	FY71	FY81	FY89	FY71	FY81	FY89
	(000 Metric tons)			(Kilograms per hectare of foodgrains)		
Urea	212	570	1135	21.1	52.2	105.2
TSP	76	218	416	7.6	20.0	38.6
MP	18	46	94	1.8	4.2	8.7

1/ Fertilizer use per hectare of foodgrains can serve as a rough indication of the general rise in fertilizer consumption. Actual applications, would, of course, vary greatly depending on the crop, seed variety, soil composition and water control.

Source: BADC

### Recent Trends in Food Production

15. This section will focus initially on foodgrains which remain the overwhelmingly dominant staple of the Bangladeshi diet. Because data on minor foodgrains are scant, the analysis will focus only on the two major foodgrains, rice and wheat, which account for approximately 80 percent of cultivated area. Other foodcrops include pulses, oilseeds, tubers, sugarcane, spices, fruits and vegetables. Jute, while not a foodcrop, is included because of its importance as one of the few large-scale substitutes for rice production.

#### Foodgrains

16. Rice production increased at an average rate of two percent per annum in the period FY61-90. Both aman and aus production grew by less than one percent, while boro output increased tremendously, by nearly nine percent per annum. Overall, growth slowed in the 1970s--hampered by war, floods and drought--and increased moderately in the early 1980s. The growth of rice production has been accompanied by important changes in the composition of output. Production of HYVs grew rapidly, particularly boro rice. While HYVs accounted for about a

third of all rice production in FY74, this figure rose to 58 percent by FY90. Adoption of HYVs occurred at varying rates for aus, aman and boro, depending on the degree of water control available to producers. As a result, by FY90, 94 percent of boro production was HYV, compared to only 42 percent of aman and 26 percent of aus. The share of boro in total rice production also rose, from just five percent in FY61 to 35 percent in FY90. To some extent, this increase in boro displaced wheat production in the rabi season, as well as local and HYV aus, which overlaps with the boro planting season in some areas.

Table 2.3 : Foodgrain Production, Area and Yields, FY61-90

	-----000 MT-----				-----Percentage annual growth 1/-----			
	FY61	FY70	FY80	FY90	FY61-70	FY70-80	FY80-90	FY61-90
Rice	9,827	11,344	12,539	18,489	2.4	1.8	2.7	2.0
Aus	2,537	2,726	2,809	2,489	2.7	1.5	-1.4	0.6
Local	-	-	1,979	1,868	-	-	-0.7	-
HYV	-	-	830	623	-	-	-3.1	-
Aman	6,679	6,980	7,303	9,527	0.3	2.1	1.1	0.8
Local	-	-	5,595	5,626	-	-	-1.3	-
HYV	-	-	1,882	4,001	-	-	6.4	-
Boro	455	1,038	2,427	6,471	17.9	0.7	9.2	6.7
Local	-	-	545	388	-	-	-4.5	-
HYV	-	-	1,882	6,083	-	-	11.5	-
Wheat	33	59	823	890	12.5	22.5	-0.2	16.3

	-----000 hectares-----				-----Percentage annual growth-----			
	FY61	FY70	FY80	FY90	FY61-70	FY70-80	FY80-90	FY61-90
Rice	8,867	10,314	10,159	10,478	1.9	0.3	0.0	0.6
Aus	2,550	3,424	3,037	2,268	3.8	0.0	-2.4	-0.1
Aman	5,990	6,006	5,974	5,704	0.3	0.2	-1.0	0.1
Boro	408	883	1,149	2,511	0.2	1.9	8.0	5.9
Wheat	57	120	433	592	1.9	10.9	1.6	10.6

	-----MT/Hectares-----				-----Percentage annual growth-----			
	FY61	FY70	FY80	FY90	FY61-70	FY70-80	FY80-90	FY61-90
Rice	1.092	1.154	1.234	1.765	0.4	1.5	2.6	1.3
Aus	0.995	0.879	0.925	1.100	-1.1	1.6	1.0	0.4
Local	..	..	0.751	0.981	..	..	2.1	..
HYV	..	..	2.083	1.728	..	..	-2.4	..
Aman	1.132	1.159	1.223	1.670	0.0	1.9	2.1	0.9
Local	..	..	1.097	1.274	..	..	1.0	..
HYV	..	..	1.959	2.933	..	..	2.0	..
Boro	1.117	2.189	2.112	2.577	8.0	-1.2	1.1	2.6
Local	..	..	1.282	1.293	..	..	-0.9	..
HYV	..	..	2.601	2.751	..	..	-0.2	..
Wheat	0.574	0.874	1.899	1.508	4.3	10.5	-1.4	5.1

1/ Trend growth rates are computed using semi-logarithmic trend equations fitted to the time series data, using the least squares method.

17. The area devoted to rice production has grown by less than one percent per annum in the past thirty years, with most of this growth occurring in the 1960s. Overall, growth stopped in the 1980s, but important shifts occurred as area devoted to aus and aman rice declined, while the area under boro rice grew by eight percent per annum. Average yield (of milled rice) has risen from 1.09 MT/Ha in FY61 to 1.77 MT/Ha in FY90. The increase in yields in the 1980s averaged 2.6 percent per annum, and can be explained by two factors: first, the yields of boro and aman rice rose quickly as HYVs were substituted for local varieties. Second, the share of boro--the highest yielding rice variety--in total rice production rose dramatically, raising the overall yield. However, it is important to note that the yields of the HYVs have not increased since their introduction. The trend in HYV aman yields for FY80-90 was pulled up solely on the basis of the exceptional FY90 crop. In the case of HYV aus, yields have declined substantially as farmers shifted the most productive land into higher yielding boro production. This lack of improvement in HYV yields is a serious concern for the future, because there are limits to the extensification of HYVs beyond which growth of production will solely depend on yield improvements. While current yields in Bangladesh are well within the range of other South Asian countries, they remain on the low side, and considerable improvement should be possible through better water management and optimal fertilizer application.<sup>2/</sup>

18. The area under wheat cultivation grew rapidly in the 1960s and 1970s, from a very small base, but slowed to a rate of less than two percent per annum in the 1980s. Despite this early growth, the area devoted to wheat accounts for only five percent of total foodgrain area. Impressive rates of growth for yields were maintained in the 1960s and 1970s as improved seed was substituted for virtually all local production. Once this substitution was complete, growth of yields stagnated and then declined, probably due to competition from HYV boro for the most productive land.

19. Production of rice and wheat together expanded at a rate of 2.2 percent per annum in the FY61-90 period, falling short of the population growth rate. A modestly declining trend in per capita production in the 1980s was reversed solely on the basis of the record harvest of FY90, which brought per capita foodgrain production for that year up to 173 kg., a level achieved infrequently in the past. Per capita production has fluctuated considerably from year to year, dropping to as low as 135 kg. in FY72 and FY73 due to drought and war. Vulnerability to flood and drought remains a reality for Bangladesh, causing extensive damage to foodcrops. While the adoption of irrigation technology and HYVs in the rabi season has reduced the flood-related variability of rice production from year to year, the risk of flood has also slowed the adoption of HYVs for monsoon-season crops. The remaining uncertainty of production has made emergency foodgrain availability a key objective of the Government's food policy.

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<sup>2/</sup> In recent years, yields in Bangladesh have been at or above yields in India, Nepal and Thailand, but well below Pakistan, Myanmar, Indonesia, Malaysia, Sri Lanka and the Philippines. In general, yields in South Asia are only half that of many East Asian countries using the same seed technology -- leaving scope for considerable improvement without breakthroughs in new technology.

### Other Foodcrops

20. Adoption of green revolution technology has favored rice cultivation by substantially reducing unit costs of production. As a result, production of many alternative crops stagnated or declined in the past decade. Production of pulses and oilseeds appears to have been most affected, although existing data must be interpreted with extreme caution due to adjustments in the historic series and partial coverage of the many crop varieties. Pulse production has actually been losing ground to rice since the 1960s, while imports from neighboring India have served to fulfill domestic demand. The downward trend in area devoted to pulse production accelerated in the 1980s, although output fell less precipitously. Oilseed production fulfills about one-third of domestic demand for edible oils, with the rest being imported commercially or as food aid. Production of oilseeds expanded rapidly in the 1960s as both area and yields increased. Growth stagnated, and then reversed, in the 1970s due to strong competition from wheat. The decline in output continued through the 1980s as area was converted to boro production.

21. Potato production expanded rapidly in the 1960s, slowing in the 1970s and stagnating in the past decade. Sweet potatoes, which figure most heavily in the diet of the poor, have experienced little growth of production. Overall, the area devoted to tubers has declined in recent years, but this has been countered by improved productivity due to dissemination of technical inputs and better cold storage capacity. The producer price for sugarcane is set by the Bangladesh Sugar and Food Industries Corporation (a state-owned enterprise) which enters into contracts with farmers, providing them with inputs and extension services. In addition to the industrial market for sugarcane, a strong parallel market exists for gur, a traditional molasses-like product. Sugarcane production underwent extremely rapid expansion in the 1960s, but has stagnated since. In the 1980s, yields dropped at the same time that area increased, with little impact on output levels.

22. Since 1976, trade in raw jute has been almost completely privatized, although state-owned enterprises still conduct about half the trade in jute products. In 1981, the Government abolished the statutory minimum price (SMP) guaranteed to producers. It could no longer support this price given the declining trend in world prices. Production of raw jute competes most with both aus and boro rice for land. Although production fluctuates considerably from year to year depending on the relative prices of rice and jute, the trend in area under jute cultivation has been downward. Improvements in yields, however, served to stabilize production levels in the 1980s.

Table 2.4 : Growth of Production for Other Crops  
(Annual percentage growth rate)

	<u>FY66-83</u>	<u>FY84-88</u> 1/
<b>Pulses</b>		
production	-1.6	-1.3
area	-0.9	-2.5
yield	-1.0	1.2
<b>Oilseeds</b>		
production	3.0	-1.8
area	0.3	-2.7
yield	2.0	0.8
	<u>FY70-80</u>	<u>FY80-89</u>
<b>Tubers</b>		
production	0.5	-0.4
area	1.0	-0.7
yield	-0.5	-0.3
<b>Sugarcane</b>		
production	-0.4	0.2
area	-0.2	1.4
yield	-0.1	-1.1
<b>Jute</b>		
production	-1.2	0.3
area	-2.2	-0.8
yield	1.1	1.2

1/ Data series were revised in FY84 on the basis of more comprehensive coverage. Earlier data are not comparable.

### Recent Trends in Food Consumption and Nutritional Status

#### Food Expenditures

23. Since the mid-1970s, average per capita income in Bangladesh has expanded by nearly 1.0 percent per annum, while relative inequality has remained unchanged. Trends in other developing countries would suggest that this increase in income should have led, on an aggregate level, to some diversification of consumption away from basic foodgrains, and to some diversification of household expenditure into non-food items. Data from successive household expenditure surveys in Bangladesh indicate that expenditure on foodgrains (mostly rice) has fallen from more than 60 percent of total food outlay in the mid-1970s to less than half in 1988/89, while total food outlay as a share of household expenditures has dropped from 74 percent to 60 percent. Diversification of expenditures has gone further in urban areas, due to both higher average incomes and greater access to a variety of foods than in rural areas.

24. Research has demonstrated that food share in total household budget can be a reliable poverty indicator, with those households in which food accounts for 75 to 80 percent of total outlays likely to be at severe nutritional risk.<sup>3/</sup> These households, the "ultra poor", generally consume less than 80 percent of minimum caloric requirements, and have a hunger imperative such that they do not reduce the share of food in total outlays (nor the share of basic foodgrains in total consumption) as per capita expenditure rises. This is in contrast to the behavior of better-off households, which generally reduce the food/outlay ratio as per capita expenditure increases. Households with a food/outlay ratio of 60 to 75 percent are likely to be fulfilling 80 to 100 percent of their minimum caloric requirement, and are probably not at immediate nutritional risk, but nonetheless face hunger, deprivation and chronic or seasonal undernutrition. It is a striking measure of the magnitude and pervasiveness of poverty in Bangladesh that the average household still spends nearly 60 percent of its budget on food.

25. The same pattern of diet diversification which is seen as incomes rise through time is also evident in looking cross-sectionally at different income groups. The poorest decile of the population allocates 75 to 80 percent of all household spending for food, the middle 70 percent of the population allocates between 60 and 75 percent, and the highest quintile allocates less than 50 percent. This categorization of the population--10 percent ultra poor and 70 percent moderately poor--is remarkably close to the percentages of acute and chronically malnourished children in Bangladesh, as identified through anthropometric measurement.

#### Consumption Levels and Nutrient Intake

26. Consumption patterns by income group reveal trends which are similar to those for food expenditures. Rice is the largest element of the diet at all income levels, with the income elasticity of demand declining from 0.877 for the poorest decile to -0.005 for the wealthiest decile. Overall, per capita consumption of foodgrains in 1988/89 averaged 15.0 kg/month, which is higher than the Government guideline for minimum consumption of 13.6 kg/month. However, consumption by the poorest decile of the population was less than 70 percent of the guideline. If one looks at consumption data through time, it appears that per capita consumption for most major food items was higher in the second half of the 1980s than in the first, raising both caloric and protein intake. In 1985/86, the last year for which data is available, foodgrains supplied an average of 80 percent of caloric intake, followed by fats and oils (3.0 percent), pulses (3.0 percent) and vegetables (2.8 percent). Foodgrains also provided 62 percent of protein intake, followed by fish (12 percent), pulses (8 percent) and vegetables (5 percent). Reliance on low-cost sources of proteins has kept average per capita protein intake above the recommended minimum recommended requirement of 45 grams per day.

#### Nutritional Status

27. It is perhaps most indicative of the widespread nutritional inadequacy in Bangladesh that in anthropometric surveys, more than 90 percent of Bangladeshi

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<sup>3/</sup> For a discussion of food share as a poverty indicator, see Lipton, M., Poverty, Undernutrition and Hunger, World Bank Staff Working Paper, The World Bank, 1983.

children fall below the international (CNHS) reference median for height-for-age, and nearly 80 percent are below the reference median for weight-for-height. Long-term, chronic malnutrition is typically assessed on the basis of height-for-age, while acute malnutrition is best measured on the basis of weight-for-height, which can indicate relatively short-term losses of body tissue and fat which place a child at immediate nutritional risk.

28. Acute Malnutrition: Data on weight-for-height among children age 6-71 months indicate that about 15 percent of the children sampled showed signs of moderate (13-14 percent) or severe (1-2 percent) wasting, and that wasting was marginally more prevalent in rural areas than in urban areas.<sup>4/</sup> Micro surveys, however, have found a high level of wasting in urban slums--highlighting a nutritional problem which is often overlooked when urban data are aggregated. The weight-for-height indicator shows greater seasonal variability than other indicators, with wasting peaking during June-July (prior to the boro and aus harvests), and declining sharply in the January-March dry season, when food availability is high and incidence of diarrheal disease is at an annual low. A recent study of two villages, one dominated by traditional agricultural methods and one dominated by modern irrigation technology, found that the former village had two distinct lean seasons (June-July and September-October) in which energy intake dropped significantly. The latter village, however, had much higher rice intake, which reduced diet diversity but also virtually eliminated the seasonality of energy intake.<sup>5/</sup>

29. Chronic Malnutrition: Prevalence of stunting in Bangladesh provides evidence that the vast majority of children suffer from chronic malnutrition. Survey data show that about two-thirds of the children sampled were moderately or severely stunted. Severe stunting was more prevalent in rural areas than in urban areas, and among girls rather than boys. As an indicator of long-run nutritional status, stunting generally does not exhibit a seasonal pattern. Nonetheless, the data do seem to consistently show a moderate increase in prevalence of stunting in the post-harvest periods of January-March and July-September. It appears plausible that growth-faltering in the lean seasons preceding these periods could progressively raise the prevalence of stunting, with the effects being fully evident in the subsequent harvest period. Additional study would be needed to test this hypothesis, however.

30. Maternal Malnutrition : Women eat least and eat last in Bangladesh, and their weight tends to decline in the September-November lean season. Pregnant women whose third trimester falls in this season have the lowest total weight gain (often less than 3.0 kg.) during pregnancy. They also have the highest rate of neonatal mortality, which has been shown to be inversely related to the pre-

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<sup>4/</sup> Anthropometric data are drawn from the 1985/86 and 1988/89 Child Nutrition Status Modules of the Household Expenditure Survey, carried out by the Bangladesh Bureau of Statistics.

<sup>5/</sup> Mohammad-Abdullah, "Modernization of agriculture and seasonality in food intake", Nutrition Reports International, 1988.

conception weight of the mother and weight gain during pregnancy.<sup>8/</sup> Overall, an estimated one out of six pregnancies ends in foetal death, and 25 to 50 percent of live births have low birthweight (less than 2.5 kg), greatly increasing the risk of infant mortality. Women tend to lose weight with each additional pregnancy and lactation, in a cycle that has been termed the "maternal depletion syndrome". Declining nutritional status thus places great strain on women, as well as increasing the odds that their children will die in the first five years of life.

31. Nutrition-related Morbidity: One in eight Bangladeshi babies dies before his/her first birthday, usually as a result of the nexus between malnutrition and infectious disease. Diarrhea, which impedes the absorption of nutrients, is the primary cause of death among children in the developing world. In Bangladesh, it was found that approximately one-quarter of the children sampled in FY88/89 had had at least one diarrheal episode in the three months preceding the survey. These children were twice as likely to suffer from acute malnutrition as those who had not suffered a diarrheal episode, and the risk of severe wasting rose with multiple episodes. Vitamin and micronutrient deficiencies are also prevalent, including vitamin A deficiency (xerophthalmia), iron folate deficiency (anemia), and zinc deficiency, which has been found to impede weight gain in severely malnourished children.

32. Intrahousehold Food Distribution: It is a widely held belief that women and children are disadvantaged by the intrahousehold distribution of food in Bangladesh. Recent evidence suggests this is so. A number of studies have identified gender-based differentials in energy intake, nutritional status and mortality rates, and evidence that sons are favored relative to daughters in terms of food quality, extent of child care and expenditure on health care.<sup>1/</sup> The bulk of evidence supports the view that women and children disproportionately suffer the effects of malnutrition and morbidity associated with malnutrition. Poor women and children should, therefore, be the primary focus of food, nutrition and income-generating programs aimed at improving nutritional status in Bangladesh.

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<sup>8/</sup> Pebley, A., S. Huffman, AKMA Chowdhury and PW Stupp, "Intra-uterine Mortality and Maternal Nutritional Status in Rural Bangladesh" Population Studies, 1985, No. 39.

Chowdhury, AKMA, "Changes in Maternal Nutritional Status in a Chronically Malnourished population in Rural Bangladesh", ICDDR.B, 1985.

<sup>1/</sup> Hassan, Ahmed, "Household distribution of energy intake and its relationship to socio-economic and anthropometric variables," Food and Nutrition Bulletin, 1986.

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### CHAPTER III

#### Incentives for Food Production in the Medium-Term

##### The Policy Framework

33. In a country that has been plagued over the years with drought, flood and food shortages, the Government of Bangladesh has played an active role in trying to alleviate the problems of famine and malnutrition. This role consisted initially of distribution of staple foodgrains which had been purchased from the domestic or international market, or obtained from donors in the form of food aid. In recent years, this system has begun to evolve into less of a substitute for private sector marketing, and more of a tool for stabilizing domestic prices and targeting assistance to the poor. The policy mechanisms employed in recent years include:

- a. Trade and exchange rate policy: a ban on foodgrain exports, a Government monopoly on foodgrain importing (commercial and food aid imports) and a managed exchange rate<sup>1/</sup>;
- b. Domestic market regulation: restrictions on the movement and storage of foodgrains, prohibition against extending bank credit for foodgrain storage;
- c. Commodity price stabilization: open market sales of wheat and rice at a pre-determined ceiling price during times of price peaks, public sector procurement of rice and wheat at a pre-determined floor price in the post-harvest period; and
- d. Targeted rationing: foodgrain distribution through more than a dozen channels, with different subsidy rates, and distribution of sugar, salt and edible oil in certain channels.

34. Since 1985, the Government has pursued a managed exchange rate policy which has succeeded in closing the gap between the official rate and the secondary rate (the wage earners' rate), and led to a nominal depreciation of about 25 percent against the dollar by mid-1990. However, exchange rate movement has not been as flexible as it could have been, particularly relative to the aggressive exchange rate policies of many high-growth Asian countries with whom Bangladesh competes (see Annex 4, Figure 4.1). Instead, Bangladesh has relied on import tariffs and export subsidies to stimulate domestic production.

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<sup>1/</sup> In principal, the private sector can import foodgrains, with the imposition of a 20 percent customs duty, an 8 percent development surcharge and a 20 percent sales tax. However, essentially all rice and wheat imports are brought in, tax-free, by the Ministry of Food. In recent years, most importing has been wheat, supplemented by relatively small quantities of rice.

35. Regulation of the domestic market for foodgrains was intended to prevent private sector speculation and hoarding in times of crisis. These restrictions have been enforced only sporadically, and were temporarily suspended during the abundant harvests of FY90. They have not been permanently abolished, however, creating uncertainty in the policy environment that inhibits the transport and storage needed for private sector stabilization of foodgrain prices across regions and seasons. The lack of private sector external trade may also destabilize prices in the domestic market, by making Bangladesh more vulnerable to fluctuations in domestic production. Government price stabilization efforts have had some success in keeping prices at or below a ceiling price in localized markets, but relatively little success in maintaining a floor price through domestic procurement. This is because procurement has been used primarily to fulfill the needs of the distribution program, rather than as a price support mechanism. Distribution through ration channels is about ten times the volume of open market sales for price stabilization, and occurs even at times, and in places, where the Government is procuring domestic production to support producer prices.

36. The impact of these food policies on incentives for domestic production is seen in their effect on the relative prices of alternative crops. In the past, two concerns, somewhat contradictory in nature, have been voiced: First, is the question of whether Government intervention in the foodgrain market translated into a "cheap food policy" which taxed agricultural production for the benefit of consumers. Such a consumption bias would occur if market prices were consistently held below world prices through frequent public sector injections of foodgrain--particularly at subsidized prices--into the domestic market. Second, is the question of whether Government price supports for rice and wheat, or other food policy measures, created a production bias in the agricultural incentive system which favored foodgrains at the expense of crop diversification. A third question then derives from the previous two: if consumption and production biases exist, are these distortions warranted in the future given the changing production environment? An analysis of economic and financial profitability, comparative advantage and market protection for alternative crops is needed to begin answering these questions.

#### Protection, Profitability and Comparative Advantage in Agriculture

37. A broad range of cropping activities was selected for analysis in order to capture some of the diversity in production and marketing costs that is often lost when national data are aggregated and averaged. In keeping with the primary focus of Government food policy, a large portion of the modeling was of alternative rice production systems. Twenty-two rice production activities were defined, on the basis of season, seed variety, planting technique, water control, land type and region of the country. Seasons included aman, aus and boro; seed varieties were either local or high-yielding; and planting technique distinguished between broadcast and transplanted. Water control options were either rainfed or irrigated, with several different irrigation technologies. Some rainfed HYV crops were assumed to use supplemental irrigation. Land type was based on the level and duration of inundation, and the country was divided into four quadrants to reflect broad differences in climate, soils, market location and factor costs.

38. An additional 23 representative food and cash crops were modeled, including wheat, potatoes, mustard seed, lentils, chillies, jute, sugarcane and cotton. Detailed production, marketing and processing budgets were prepared for each of the 45 crop activities, from which were derived indicators of financial and economic profitability, nominal and effective protection and comparative advantage.<sup>2/</sup> The exchange rate prevailing in mid-1990 (Tk 35.5/US\$) was used to convert world prices into domestic currency prices for the financial analysis. For the economic analysis, a 20 percent premium was added to the official exchange rate to examine the impact of exchange rate movement on profitability. As a sensitivity analysis, economic profitability was then calculated at the prevailing exchange rate, as well.

#### Nominal and Effective Protection

39. The impact of public policy on the financial incentives for food production is reflected in the gap between financial and economic prices--that is, the level of protection afforded the commodity. A nominal protection coefficient (NPC) of greater than one indicates that the public sector has protected domestic production by raising its financial price in the domestic market above its economic price. However, if inputs are also protected, this reduces the effective level of protection afforded the commodity.

#### Rice

40. Before turning to the results of the analysis for rice, a word about the world reference price is in order. Quality distinctions based on degree of brokenness, grain length, humidity, color and taste create large price differentials in the international rice market. In 1990, a high-quality, Thai, 5 percent broken rice was selling for US\$ 275-300/MT (FOB), while the lowest-quality, 25+ percent broken were selling for as little as US\$ 135-160/MT. Most Bangladeshi rice is of variable, but generally quite low, quality, and is not color sorted. International rice traders examining Bangladeshi samples agreed that, in its present form, an FOB price of US\$ 150/MT (in 1990 dollars) could serve as an appropriate reference price. If automatic mills could reduce the level of brokenness to 15 percent, and if a grading system were strictly adhered to, the resulting quality improvement could probably raise the appropriate reference price to US\$ 200/MT in coming years. However, unless they are motivated by export opportunities, millers are unlikely to make such improvements. In the analysis that follows, two scenarios for rice are examined: a base scenario with a US\$ 150/MT reference price, and an optimistic scenario with a US\$ 200/MT reference price.

41. The results of the analysis indicate that at the prevailing exchange rate, rice is moderately protected from international competition by domestic policies. Nominal protection coefficients (NPCs) for the 22 rice models range from 1.23 to 1.54 under the base scenario. At the same time, the NPCs for inputs were uniformly close to one for all rainfed rice. Protection of inputs for irrigated boro was higher due to taxes on tradeables, especially fuel for irrigation pumps.

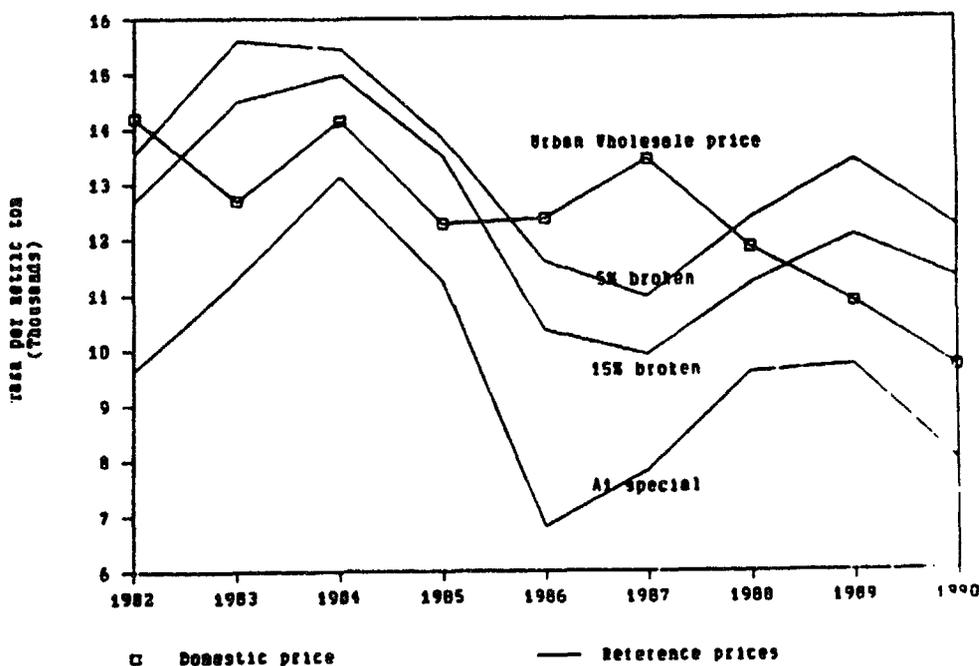
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<sup>2/</sup> See Annex 4 for a detailed description of the methodology.

The relatively low level of protection on inputs suggest that the recent liberalization of fertilizer and irrigation equipment markets has eliminated many distortions, although further rationalization of taxes and subsidies is needed. As a result, effective protection coefficients (EPCs) for rice range from 1.17 to 1.56 under the base scenario. The most instrumental policy in providing this protection has been the Government's monopoly on external trade, which has restricted the flow of imports and resulted in higher prices than would have prevailed in a free market.

42. Rice production in Bangladesh was moderately protected for most of the past decade. Figure 3.1 compares domestic urban wholesale prices with world reference prices for three qualities of rice. While A1 Special rice is not the same type of rice as Bangladeshi rice, international traders agree that its quality places it in the same price range. Domestic prices were consistently above the A1 Special reference price during the 1980s. This price wedge entails an efficiency loss for Bangladesh associated with maintaining prices above the long-run opportunity cost of rice, as well as a transfer of income from consumers to producers. One cannot claim that there has been a consumption bias for rice in the past decade, although such a bias was evident during much of the 1960s and 1970s. In fact, a review of South and Southeast Asian countries reveals that

Figure 3.1: Domestic and World Reference Prices for Rice, 1980-90 (urban wholesale level)



virtually all net importers of rice have protected their domestic markets in the latter half of the 1980s and the early 1990s. NPCs range from 1.08 to 1.45 percent, with even higher effective protection due to input subsidies. Major rice exporters, on the other hand, have taxed foreign consumers in order to subsidize domestic consumption.

43. Net NPCs and EPCs were calculated at the premium exchange rate (i.e. 20 percent higher than the official rate). At this higher rate, the positive protection afforded by import restrictions is reduced, but not eliminated. Net NPCs range from 1.02 to 1.28, and net EPCs from .98 to 1.30 under the base scenario. If one assumes the optimistic reference price of US\$ 200/MT, nominal protection at the official exchange rate is accordingly lower, but still positive, with NPCs ranging from .97 to 1.22. However, effective protection is eliminated at this reference price for most rice.

#### Other food crops

44. Nominal protection of wheat is slight at current world prices, with NPCs of only 1.03 to 1.09. At the premium exchange rate, net NPCs drop below one. Protection of inputs is essentially the same as for irrigated rice production. EPCs are less than one, and in several cases negative, meaning that the combined effect of input and output policies has provided negative protection of wheat production, and even generated negative financial value-added for some wheat models. Government policies are, therefore, inhibiting wheat production rather than encouraging it. This does not imply, however, that in the absence of Government intervention, Bangladesh would have a comparative advantage in growing wheat (para. 53).

45. Potatoes benefit from relatively high nominal protection (NPCs of 1.86-1.97), reflecting the high import duties placed on most tubers and vegetables. It may also reflect inefficiencies in the cold storage facilities needed to import potatoes. Although nominal protection of inputs for potato production is high compared to that for foodgrains, effective protection for potatoes remains highly positive (1.88-2.01), even under optimistic assumptions of world price. Lentils, chillies and, in particular, mustard seed show high levels of protection at both the official and premium exchange rates, reflecting the high customs, sales and development taxes levied on imports. However, these crops use fewer taxed tradeable inputs than potatoes, so that effective protection levels are significantly higher for some of these crop models (1.44-6.36). High protection for these crops relative to rice suggests that food and agricultural policies which affect prices are not systematically creating a production bias in favor of foodgrains. Nonetheless, other policies which don't impact directly on prices may still create such a bias. Research and extension services, for instance, may be excessively oriented toward foodgrain production. Similarly, Government price stabilization may not necessarily alter producer prices, but it may reduce the risk involved in foodgrain production relative to other crops.

46. A brief review of cash crops indicates high rates of nominal and effective protection for sugarcane, and negative rates of nominal and effective protection for cotton. Bangladesh is one of the dominant exporters of jute in the world market, so that protection levels take on a different meaning. Highly negative

nominal and effective protection rates at the export level reflect Government policies to implicitly subsidize domestic industries' consumption of local jute by taxing foreign buyers.

### Financial and Economic Profitability

47. Financial profitability is expressed as private profitability per hectare, including the estimated cost of family labor and land rental. Because of the difficulty in estimating the opportunity cost of family labor and land, and because cash needs often have the strongest influence on marketing decisions, it is useful to look at cash returns as well, which reflect farmers' financial profits before deducting for family labor and land. Economic profitability is an indicator of the relative efficiency of domestic production. It indicates whether the domestic economy has a comparative advantage in producing a particular commodity relative to other countries, as well as relative to other commodities that could be produced. Economic profitability is expressed in terms of net economic value (NEV) or through the calculation of domestic resource costs (DRCs). If the DRC is greater than one, it implies that the economy loses foreign exchange through domestic production of the commodity, while a DRC of less than one implies that production is efficient and makes a positive contribution to domestic value-added. A country may have a number of efficient production opportunities, but in order to maximize economic growth, should pursue those for which it exhibits the strongest comparative advantage (i.e., the lowest DRC). Of course, equity considerations and other important social and political factors will also influence production decisions, and may entail some loss of economic efficiency.

### Rice

48. At the farm level, all rice crop models show positive cash returns, ranging from Tk 2,992 to Tk 15,880 per hectare. Financial profitability, taking into account the estimated cost of family labor and land, was positive for all aman and boro models, as well as for HYV aus production, but negative for most traditional aus models. This is in keeping with the declining trend in production of traditional aus. Findings of negative profitability may also reflect an overestimation of the opportunity cost of family labor and land. Findings of negative financial profitability for paddy production at the farm level have been common in many Asian countries, with no apparent affect on farmers' decision to continue growing rice--suggesting overestimation of the opportunity costs for family labor and land. For this reason, it is worth looking at the cash returns to land and to family labor, as well. Here, too, it appears that aman and boro production are more remunerative than traditional aus production. HYV aus production looks attractive, but potential is limited due to the high risk of flooding before harvest.

49. Analysis of economic profitability confirms what most believe to be the case: Bangladeshi farmers are efficient producers of rice for import substitution. At the farm level, using the reference price of US\$ 150/MT, NEVs are positive, and DRCs are less than one for all rice production, except two low-yielding crop models. HYV aman is particularly competitive, with DRCs as low as

0.21 for some models. At the level of urban wholesale markets, domestic rice production proved economically competitive for all but seven models (mostly traditional aus) at the lower reference price (US\$ 150/MT), and for all but one aus model at the higher reference price (US\$ 200/MT).

50. A sensitivity analysis of exchange rate movement was also undertaken. DRCs were initially calculated at the premium exchange rate, but were recalculated using the prevailing exchange rate (Tk 35.5/US\$). It was found that at the prevailing rate, nearly half the rice models (particularly rainfed aman and aus) were not competitive with imports at the wholesale level. Furthermore, six rainfed models -- four aus and two aman -- were not competitive with imports, even at the farm level under the base scenario. Two points are salient: first, if Bangladesh--with its abundant water and low labor costs--cannot compete with imports for rainfed rice production at the farm level, then adjustment of macroeconomic variables may be in order. Second, complete liberalization of the trade regime for rice, in the absence of appropriate tariff policy or exchange rate movement, could have a negative impact on production of traditional aman and aus varieties.

51. The potential for rice exports from Bangladesh has been much debated by policymakers in the past two years, but the debate has been complicated by lack of clarity in the questions being asked. In fact, two separate questions are pertinent: if the question being asked is whether Bangladesh could ever export rice efficiently, the answer is yes. If the question is whether the private sector would be motivated to do so in the current policy environment, the answer is no. Analysis of financial profitability at the export level confirms what private traders already know: at the prevailing exchange rate, and given the current quality of Bangladeshi rice, it is not financially profitable to export. Indeed, the financial incentive is to import, as was evident in the analysis of market protection. However, an examination of economic profitability for exports at the premium exchange rate shows positive profitability for one-third of the models under the base scenario,<sup>2/</sup> and two-thirds under the more optimistic pricing scenario. These are mostly high-yielding aman and boro varieties. At the higher reference price of US\$ 200/MT, seven of the rice models even show positive financial profitability for exporting at the prevailing exchange rate. However, in order for exporting to be attractive to the private sector, financial profitability must not only be positive, but must also be greater than that of the domestic rice market or markets for alternative crops.

#### Other crops

52. In assessing the incentives for crop diversification in Bangladesh, it is important to remember that the conclusions presented here are based on static assumptions about input coefficients, yields and input and product prices, which were modeled to reflect mid-1990 conditions. Variability in domestic and world prices can quickly change financial incentives for farmers. For this reason,

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<sup>2/</sup> The calculation of economic profitability also uses economic costs for inputs. However, there is little difference between the financial and economic costs for most inputs, so that the difference between financial and economic profitability for exports is mostly attributable to exchange rate movement.

wherever possible, sensitivity analyses were undertaken for output prices, taking into account projected pricing trends for the next five years. With this caveat in mind, the analysis nonetheless gives rise to a number of conclusions which appear robust for a range of pricing assumptions.

53. All the crop models for wheat exhibit negative financial profitability, and two out of three have negative cash returns as well. The current producer price would have to rise by 50 percent for financial profitability to be positive at the farm level. Economic profitability is also weak, with only certain parts of the country having the necessary climatic and soil conditions for efficient wheat production. Most DRCs far exceed unity, indicating that wheat is not competitive with imports at either the wholesale or farm level. With world prices expected to decline in coming years, the outlook for Bangladeshi wheat will not improve--barring unanticipated breakthroughs in the development of heat-resistant and better-adapted wheat varieties. This has important implications for food policy. The country does not have a comparative advantage in wheat, and protecting the domestic market in order to promote self-sufficiency would bear a cost for consumers which far exceeds the benefits that could be derived from marginally higher wheat production. Bangladesh should continue to import wheat on a large-scale to fulfill domestic demand. Although a future reduction in rice prices could induce some consumption switching away from wheat, rising incomes and rapid urbanization will inevitably lead to diversification of consumption, with an increased demand for wheat flour products. Given balance of payments constraints, a continued reliance on food aid to fulfill a large portion of this wheat demand is sensible, regardless of whether the country has achieved or surpassed self-sufficiency in rice.

54. Potatoes have been cash returns and financial profitability in the Northeast division. They also appear to have a strong comparative advantage in the domestic market, and limited export potential at relatively high world prices that would reflect a high-quality product. Chillies and other condiments currently appear to be highly profitable in financial terms. However, they are not a staple crop, so that producer prices may be highly sensitive to changing market conditions. Economic profitability is also high, and if a quality product can be marketed, it would have export potential. Mustard seed, which makes up the largest share of oilseeds in Bangladesh, shows somewhat lower, but still positive cash returns and financial profitability. However, its financial profitability is due to heavy import duties placed on oilseeds and edible oil. The country does not have a comparative advantage in mustard seed at 1990 world prices, and shows only weak competitiveness with imports at the farm and wholesale level if a higher, projected 1995 world price is used. If production of other oilseeds exhibits the same lack of efficiency, protection of the edible oil market through import duties will cost consumers more than it is worth, despite the benefits for the Government budget. Bangladesh should expect to continue importing a large portion of its edible oil supply, and should ease its foreign exchange constraint by encouraging the use of edible oil as a food aid commodity. Lentils have cash returns and financial profitability similar to that of mustard seed, but, unlike mustard, are strongly competitive with imports at the wholesale and farm level, and even have potential for export.

55. Food crops also compete with a number of cash crops. At 1990 prices, cash returns and financial profitability for jute are positive, and significantly higher than for traditional aus at the farm and wholesale level. Bangladesh is the world's largest jute exporter, and shows a strong comparative advantage in jute production for export, even at the lower prices projected for coming years. Although cotton shows positive cash returns, its financial profitability is negative for all but the highest-yielding models at the ex-ginnery and millgate levels. Nonetheless, Bangladesh appears to have a strong comparative advantage in cotton production, even at the export level. However, official procurement prices offered by public sector mills clearly don't reflect opportunity costs, and provide inadequate financial incentive for a crop with considerable economic potential. A similar situation exists for sugarcane which is processed into white sugar by public refineries. Official procurement prices are well below the market value for sugarcane, generating negative financial returns at the farm and wholesale level. In contrast, the private market for gur generates strong positive cash returns and financial profitability for sugarcane, especially based on intensive cultivation using space-transplanting. In economic terms, both gur and white sugar are competitive with imports, and gur could even be exported profitably to neighboring countries. However, sugarcane production, as with cotton production, is currently constrained by official pricing policy. Market liberalization, like that for jute in the early 1980s, could only benefit production of these two crops.

56. The economic profitability analysis suggests that Bangladesh has a comparative advantage in many foodcrops, including certain tubers, pulses, vegetables and condiments, as well as in the principal cash crops: jute, cotton and sugarcane. Field trials also indicate that maize could be highly profitable if linked to the growing poultry feed industry. The greatest scope for crop diversification is found in the rabi season, when most pulses, oilseeds, tubers, vegetables and condiments are grown. However, diversification will depend on the financial incentives for farmers to switch into production of other crops. A comparison of financial incentives for various crops shows that, of the crops examined, only potatoes and chillies offer financial incentives (expressed as cash returns, financial profitability or return to family labor) which are equally or more attractive than boro rice in rabi season. However, potato production appears to have very high returns in the Northeast quadrant of the country, while HYV boro production looks more attractive in the Northwest, where rice surpluses tend to be generated. In terms of cash or financial returns, boro is clearly more attractive than pulses and oilseeds, two traditional rabi season crops. Thus, financial incentives have led farmers to switch into HYV rice production, reducing production of alternative crops, even though some of these crops have been protected in the domestic market. Farmers may also choose to grow rice -- the dominant commodity in their diet -- to reduce their risk of caloric insufficiency, even if other crops offer potentially higher returns. While this trend toward monocropping of rice has been met with some dismay by nutritionists, who value the protein and fat content of pulses and oilseeds, it is the rational response of farmers to existing financial incentives. Furthermore, the increased reliance on HYV rice production appears to have reduced seasonal deficits in calorie intake which is the most fundamental aspect of nutritional status. Finally, survey data on consumption indicate that the

Bangladeshi diet is diversifying through time toward higher-quality proteins and fats--even among the rural poor.

57. Beyond the rabi season, jute production has higher cash returns and financial profitability than most traditional aus varieties, which may explain the precipitous decline in traditional aus production. HYV aus shows high returns, but adoption of HYVs has been particularly slow for aus due to the risk of flood damage or total loss. Sugarcane production is a year-round activity. Cash and financial returns on sugarcane cultivation for gur productions are very high, and look attractive even when compared to returns on rice production for the entire crop year. Crops which are unlikely choices for diversification efforts today could show promise through increases in productivity. Non-financial factors currently reduce the productivity of alternative crops, and may, therefore, inhibit crop diversification. Among these factors are: (i) weak extension services for alternative crops; (ii) limited research on improved varieties and optimal input use for these crops; (iii) overregulation of importing and distribution of improved seed varieties; and, (iv) lack of market information and vertical linkages to processing facilities. The Government has agreed in principle to liberalize the market for imported seeds, although privatization of seed distribution channels for rice and alternative crops is needed. A review of resource allocation for research and extension is also needed to ensure an appropriate balance between rice and alternative crops. Extension services need to go beyond the production phase, to assist in building marketing links to emerging processing industries, in areas such as canned condiments and poultry feed. Examining the structure of financial incentives for agro-processing should be a high priority for the agricultural sector. In addition, continued research on rice is needed to: (i) improve yields on existing rice varieties; (ii) develop better-adapted, higher-yielding varieties; or, (iii) develop short-cycle rice varieties that permit farmers to grow both rice and alternative crops in the rabi season. Such research will encourage crop diversification by further reducing the instability and risk of rice production.

#### The Medium-term Outlook for Food Supply and Demand: Policy Options

58. Four key points can be drawn from the preceding analysis of protection, profitability and comparative advantage in agriculture. First, calculations of the foodgrain balance in Bangladesh, with demand estimated on the basis of normative consumption guidelines, have suggested that foodgrain availability (including domestic production and imports) has met or exceeded effective demand in recent years (Table 3.1). In FY90, falling market prices and high levels of both private and public stocks of rice supported this view. With aggregate demand for wheat estimated at between two and three million metric tons, it appears that the country has gone beyond self-sufficiency in rice production -- a laudable achievement, to be sure. However, the analysis of market protection in FY90 which is presented above reveals the nature of this rice "surplus", and the weaknesses in estimating demand in a normative fashion. On average, domestic market prices in FY90 remained well above the export parity price, despite the sizable increase in production. Thus, a surplus existed only relative to the price that the Government hoped to maintain in the domestic market, leading to massive public sector procurement to support prices. The official procurement price was 22 percent higher than the import parity price and 65 percent higher

than the export parity price. In the absence of Government intervention, domestic prices would have fallen further, but would not have fallen below the export parity price--indicating that the country did not have a true, exportable surplus.

Table 3.1: Foodgrain Balance, FY89-91

	FY89	FY90	FY91	FY92 (Budget)	FY92 (Projected)
Population (millions)	109.5	111.9	114.4	116.9	116.9
	(millions of MT)				
Foodgrain consumption norm (16 oz/cap/day)	<u>18.17</u>	<u>18.56</u>	<u>18.98</u>	<u>19.38</u>	<u>19.38</u>
Gross production <u>1/</u>	16.56	19.29	19.70	19.90	19.90
Seed/feed/losses (11%)	1.82	2.12	2.17	2.19	2.19
Net production	14.74	17.17	17.53	17.71	17.71
Imports	2.38	1.71	1.58	1.76	1.61
food aid	1.44	1.11	1.54	1.61	1.61
commercial	0.94	0.60	0.04	0.15	0.00
Foodgrain Supply	<u>17.12</u>	<u>18.88</u>	<u>19.11</u>	<u>19.47</u>	<u>19.32</u>

1/ Gross production figures represent an average of various estimates made by BBS, the Ministry of Agriculture and IFDC.

59. The second key point is that Bangladesh is, on the whole, an efficient producer of rice for import substitution. However, at the prevailing exchange rate, complete trade liberalization could impact negatively on traditional aus and aman production in some parts of the country. Appropriate exchange rate movement, or a second-best tariff policy, would prevent this. Indeed, with a flexible exchange rate policy like that of many high-growth Asian economies, and with strict adherence to quality standards, Bangladesh could even export rice efficiently in the future. Whether Bangladesh does or does not export rice in coming years is of less importance than the fact that it could be economically efficient to do so. The export parity price is, therefore, a relevant efficiency benchmark toward which the Bangladeshi rice market can strive. This brings us to the third point: there is currently no financial incentive to export rice. The price of rice in the domestic market would have to decline substantially relative to the world price--as a result of rapid growth of production and reduction of the real effective exchange rate--before exports would be feasible or desirable. Nonetheless, the current ban on exporting should be lifted in order to encourage a long-run export orientation that will maximize the efficiency of the rice sector in Bangladesh. The fourth point is that the

structure of financial incentives is encouraging farmers to grow more rice, rather than diversify production. The domestic price of rice would have to fall relative to the price of alternative crops before the financial returns from these crops would look attractive. Thus, questions of rice self-sufficiency, export potential, crop diversification and--most importantly--consumer welfare hinge on the evolution of rice prices in the domestic market in coming years. Will the price of rice fall? Should it? And how should Government policy influence price formation in years to come?

#### Foodgrain Supply and Demand: a Base Scenario

60. The real price of rice in the Bangladeshi market will fall if supply consistently exceeds demand, either through rapid expansion of domestic production or through trade liberalization that allows a flow of imports to reduce domestic price to the import parity level. In order to get an idea of Bangladesh's supply potential given existing technology and land availability, as well as the evolution of foodgrain demand due to population growth and income generation alone, a base scenario can be developed that assumes unchanging financial incentives for rice production in years to come. This assumption can then be relaxed to assess the likely impact of declining rice prices on aggregate supply and demand, and on the welfare of producers and consumers.

#### Sources of Growth in Foodgrain Supply

61. Growth in agricultural production is expected to come principally from increased cropping intensity made possible by: i) expanding irrigated area; ii) increasing average yields by raising the proportion of area devoted to HYVs; and, iii) increasing HYV yields through improved crop management and input use.

#### Expansion of Irrigated Area

62. Current development potential for irrigable area in Bangladesh is estimated to be 6.45 million hectares, of which 4.1 million hectares remains to be developed.<sup>4/</sup> Beyond this, irrigable area could possibly be increased through large-scale investments in flood control and drainage, although the economic and environmental impacts of such investments are still far from clear. All the supply scenarios presented here assume flood control investments would not expand the maximum irrigable area prior to the year 2005, although some assume that irrigable area rises slowly, to a maximum of 6.9 million hectares, in later years.

63. Four scenarios for irrigation expansion are examined (Table 3.2). Scenario I envisions a relatively low rate of expansion, 170,000 hectares per annum, throughout the projection period. This would represent a continuation of the average rate for the FY86-90 period. Scenario II, which can be considered the base scenario, assumes that expansion continues at a rate similar to that of the past two years, at 250,000 hectares per annum throughout the projections. Scenario III is based on projections by the Master Plan Organization (MPO) for

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<sup>4/</sup> Master Plan Organization, June, 1990, unpublished data.

the Government's Fourth Five-Year Plan (FFYP), which assume a substantial increase in the pace of expansion in the next five years, averaging 426,000 hectares per annum, far exceeding past rates of growth. Thus, the FFYP figures represent a highly optimistic scenario, with expansion dropping back to 250,000 hectares per annum after 1995. Scenario IV is a variant on Scenario III, which includes the rapid expansion of irrigation envisioned in the FFYP, but with expansion in subsequent years slowing to 150,000 hectares per annum as irrigation moves onto more marginal lands.

Table 3.2: Assumptions for Irrigation Expansion, 1991-2010

Scenario	---000 Hectares----		Increased Irrigation Potential after 2005
	per annum 1991-1995	1995-2010	
I (low)	170	170	No
II (medium)	250	250	Yes
III (high)	426	250	Yes
IV (high/low)	426	150	Yes

Adoption of High-yielding Varieties

64. Increasing the area devoted to existing high-yielding varieties is expected to provide the greatest immediate increase in foodgrain yields. Although boro rice production is already largely under HYVs, there is considerable potential to expand HYV use for aman and aus rice. However, certain factors will limit the pace and extent of the transition from traditional varieties to HYVs for aus and aman. In particular, the slow HYV adoption rate can be explained by the higher risk involved in HYV production during the rainy season, when sporadic flooding or drought can lead to partial or total crop loss. The projections assume that HYV aman areas expand at a rate of 3.7 percent per annum, or approximately the same rate as in the past decade. The area under HYV aus expands at a rate of 3.0 percent per annum. The adoption of HYV aman and aus is assumed to proceed at a steady rate until a maximum level of 55 percent of aman area and 30 percent of aus area is under HYVs.<sup>5/</sup> Expansion of HYV area for aman and aus is assumed to displace traditional varieties, and not add to total cropped area. All expansion

<sup>5/</sup> Ceilings on HYV aus and aman expansion were chosen in consultation with agronomists and agricultural economists at BARI and BIDS.

of irrigated area for boro is assumed to be for HYVs, so that the proportion of HYVs in total boro area rises from its current level of 87 percent to 98 percent by the end of the projection period.

#### Increasing HYV Yields

65. From a technical standpoint, substantial yield improvements are possible for all HYVs currently in use, through better water management, correction of micronutrient deficiencies in the soil and optimal application of commercial inputs, particularly chemical fertilizers. Actual average yields for HYVs are less than half of those achieved in supervised farm trials carried out by the Bangladesh Rice Research Institute (BRRI) throughout Bangladesh. Productivity gains may also be possible through the introduction of new HYVs which are better adapted to the natural constraints of Bangladesh: drought, heat, flooding and salt water intrusion. However, the possibility that new varieties will be developed in the next decade that would significantly raise yields above the potential of existing varieties seems remote, because few promising breakthroughs are on the horizon.

66. Despite considerable technical potential for productivity gains using existing HYVs, the extent to which yields can actually be raised in the short-run is far more limited. The gap between potential and actual yields for existing varieties reflects the fact that HYVs are being used by both skilled and unskilled farmers, often under conditions which are unfavorable and difficult to change (susceptibility to flooding, salt water intrusion, soil infertility). Although research and extension services clearly need to redouble their efforts to improve farm-level management of existing varieties, the projections make conservative assumptions for improvement of HYV yields. Aus and aman HYV yields are projected to increase by 1.0 percent per annum until yields reach a ceiling of 2.25 MT/ha (in terms of milled rice), after which they are assumed to remain constant. Boro rice and wheat yields are projected to increase by 0.4 percent per annum until reaching a ceiling at 2.75 and 2.0 MT/ha, respectively.<sup>8/</sup> No yield increases are projected for traditional varieties of rice.

#### Evolution of Effective Demand for Foodgrains

67. Foodgrain demand over the next twenty years is projected as a function of population growth, urbanization and changes in real income. The population and income growth rates were disaggregated into rural and urban components, and households were stratified by income level to allow income elasticities of demand to vary by income group.

#### Population and Urbanization

68. Structural transformation of Bangladeshi society will lead to a decline in the rate of population growth over the next twenty-five years. The projections

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<sup>8/</sup> Yield assumptions are based on historic trends, as well as estimates by researchers at BRRI and BARC of yield growth and maximum average yields obtainable with existing HYVs.

assume a starting population of 111 million inhabitants in 1990, and a growth rate of 2.3 percent per annum which falls gradually to 1.8 percent per annum by the year 2015.<sup>1/</sup> Although sensitivity analyses introducing a more dramatic drop in the population growth rate were carried out, such a decline is considered highly unlikely. It is estimated that about 19 percent of the population currently resides in urban areas, but rapid urbanization is expected to continue in coming years. For the purpose of these projections, it is assumed that 32 percent of the population will reside in urban areas by the year 2010.

#### Real Income Growth

69. Gross domestic product (GDP) increased at a rate of 3.1 percent per annum in real terms between FY81 and FY89. The projections assume an annual growth rate of real income of three percent for the base scenario, continuing the historic trend. In an accelerated growth scenario, which assumes an increased level of public investment, continued trade liberalization and a flexible exchange rate policy, growth of real income is projected at five percent per annum.

#### Income elasticities of demand

70. A recent study by Ito, Peterson and Grant found low (less than .15) or negative income elasticities of demand for rice in a number of Asian countries, including Bangladesh, indicating that rice is an inferior good in these economies. However, many other studies have found relatively strong positive income elasticities for rice, with levels falling from close to 1.0 for the lowest income groups to less than 0.4 for the highest income groups. Bouis (1989) has developed a demand system which controls for a number of variables related to structural transformation, and which explains many of the apparent inconsistencies in previous estimations of income elasticities.<sup>2/</sup> Bouis has applied his model to household expenditure data in Bangladesh to derive separate rural and urban income elasticities of demand for major food products by income quartile. For this projections exercise, five sets of elasticities (for income quintiles) have been linearly extrapolated from Bouis' estimates, and are adjusted as mean income for each group changes.<sup>2/</sup>

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<sup>1/</sup> Population size estimates have been made by the Bangladesh Bureau of Statistics (BBS), on the basis of the 1981 census. Alternative estimates by other Government offices and donor agencies generally place the population between 111.0 and 114.0 million inhabitants in FY90.

<sup>2/</sup> To model these changes, Bouis develops a food demand system based upon demand for certain food characteristics, namely bulk, variety and taste. Bouis, pp. 122

<sup>2/</sup> This was done by regressing Bouis' elasticities against their corresponding mean incomes using a quadratic functional form. The regression estimates, and a comparison of the calculated elasticities for the projections exercise with Bouis' original estimates are provided in Annex 5.

71. On the basis of these assumptions for population growth, urbanization, economic growth and income elasticities of demand, two demand scenarios for the 1990-2010 period are derived. Scenario I, with moderate economic growth, generates a lower demand for foodgrains, increasing at a rate of 2.0 percent per annum. Scenario II, with stronger economic growth, generates a higher demand for foodgrains, increasing at an average rate of 2.2 percent per annum.

Supply and Demand Projections

72. The alternative supply and demand projections are presented in Table 3.3 and Figure 3.2. The foodgrain balance (supply-demand) for the base scenario (DI and SII) is also shown, along with the rice balance. It is clear that if irrigation expansion continues at the level of the past few years, Bangladesh has the technical capacity to generate a foodgrain surplus--or to be more exact, a rice surplus. Within the limitations of existing wheat varieties, it is assumed that wheat production would increase only marginally in coming years, widening the wheat deficit as demand rises. Assuming the incentives for rice production remain strong, output could exceed domestic demand by as much as 4.5 million MT under the base scenario.

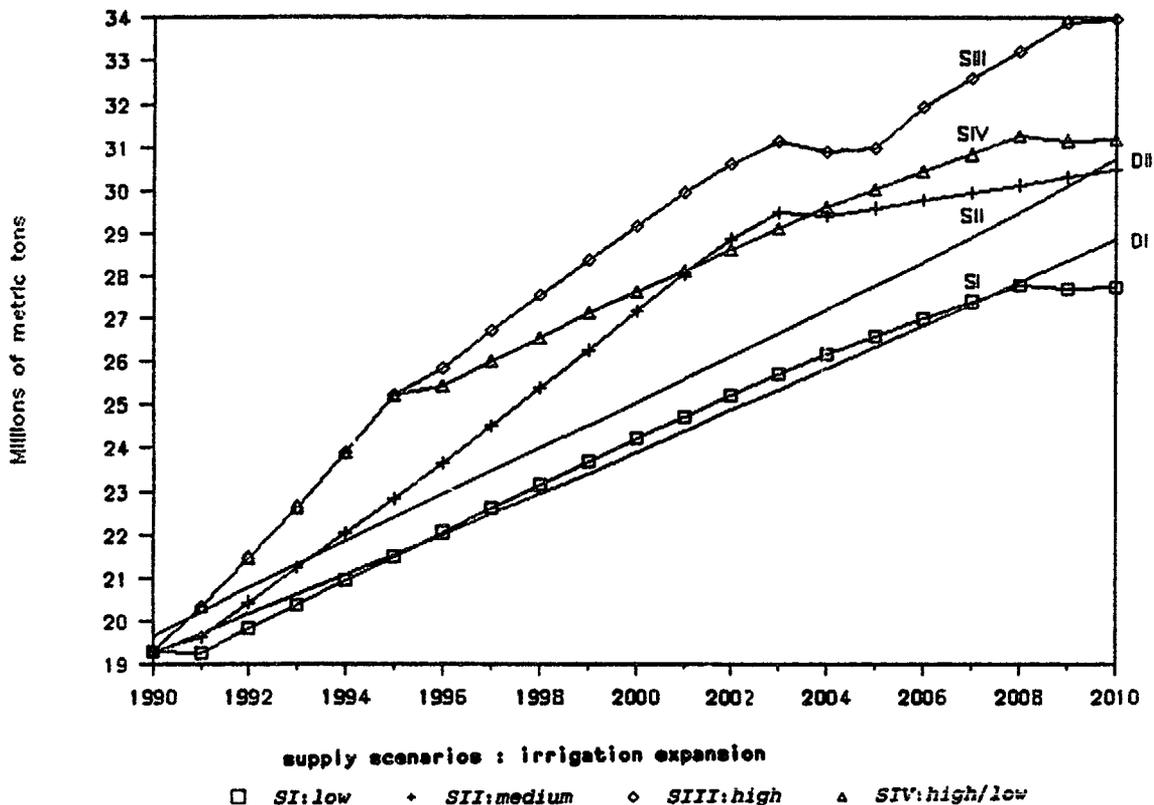
Table 3.3 Alternative Scenarios for Foodgrain Supply and Demand  
(000 MT)

Demand Scenarios		1990	1991	1992	1993	1994	1995	2000	2005	2010	
	Population decline										
	Income growth										
Demand I	gradual	3%	19,272	19,717	20,166	20,619	21,076	21,537	23,900	26,353	28,887
Demand II	gradual	5%	19,668	20,225	20,775	21,321	21,863	22,401	25,069	27,792	30,731
Supply Scenarios											
	Irrigation expansion										
Supply I	low		19,289	19,267	19,831	20,384	20,951	21,484	24,221	26,597	27,758
Supply II	medium		19,289	19,626	20,430	21,223	22,033	22,811	27,162	29,596	30,509
Supply III	high		19,289	20,324	21,467	22,631	23,888	25,220	29,173	30,971	33,984
Supply IV	hi/low		19,289	20,324	21,467	22,631	23,888	25,220	27,173	30,971	33,984
Base Scenario (DI & SII)											
Foodgrain Balance (Supply-Demand)		17	-89	264	604	958	1,274	3,260	3,235	1,622	
Percent surplus		0.1%	-0.5%	1.3%	2.6%	4.3%	5.6%	12.0%	10.9%	5.3%	
Rice Balance (Supply-Demand)		1,220	600	987	1,862	1,751	2,103	4,277	4,456	3,040	
Percent surplus		6.6%	3.3%	5.2%	6.9%	8.5%	9.8%	16.6%	15.8%	10.5%	

73. If the current dynamism of irrigation expansion is not maintained (scenario SI), the trend in foodgrain production may only keep pace with demand. Under these circumstances, production would most likely fluctuate between surpluses and deficits from year to year. For all other supply scenarios, which make more optimistic assumptions about irrigation expansion, the trend in foodgrain production remains well above projected demand in the 1990s and into the next century, even with accelerated growth of income. However, it is clear from the graph that the rate of increase in foodgrain production begins to drop off for all scenarios after the year 2002, as ceilings are reached in the assumptions

relating to HYV adoption, HYV yields and maximum irrigable area. At that point, the period of "easy" expansion from the initial adoption of green revolution technology will begin to wind down. Indeed, if Bangladesh wishes to maintain self-sufficiency or surpluses of rice in the longer run (beyond 2010), research and extension must be oriented now toward relaxing these constraints on production. Rice surpluses could be maintained well beyond the year 2010 if any or all of the following occur: i) ways are identified to substantially increase the adoption rate for HYVs in the rainy season; ii) the gap between actual and potential yields for existing HYVs are closed through improved management; iii) better-adapted HYVs are introduced; or iv) flood control investments prove to be an appropriate means of increasing irrigable area.

Figure 3.2 : Foodgrain Supply and Demand  
1990 - 2010



74. If rice production expands faster than demand at the prevailing market price, then market prices will fall. Government could try to counter this

decline through massive domestic procurement, but such a policy is financially unsustainable year after year (as was evident in the jute market in the early 1980s), and ultimately the real price of rice will decline. Indeed, in the past fifteen years, the real price of rice in the international market has declined by 50 percent, while in the domestic market, sluggish growth of production, a restricted trade regime and an official procurement price which was substantially higher than the trend in world price have limited the real decline to only 30 percent. As supply constraints are eased, there will be further downward pressure on domestic prices. Government policy--in the form of an import monopoly on foodgrains and an official pricing structure which is well in excess of world market prices--has resisted further decline in domestic prices. The rationale for this resistance has been to promote rice self-sufficiency by providing adequate incentives to farmers to grow rice. However, the greater the deviation in official prices from the world trend, the more costly and less effective it has become for the Government to try to defend these prices in the domestic market. To assess whether these policies are justified in the present context, one has to examine the impact that lower rice prices would have on aggregate supply and demand, as well as on the welfare of producers and consumers.

#### Foodgrain Supply and Demand: The Impact of Lower Rice Prices

75. Three scenarios are evaluated here which reduce the price of rice in Bangladesh to the import parity level over a five-year period, through a coordinated policy of trade liberalization and exchange rate movement. Scenario A assumes a 20 percent decline in the real effective exchange rate during this period, in keeping with the assumptions made in the preceding analysis of economic profitability. The outcome of this scenario is an 8 percent decline in the domestic price of rice over five years. Scenario B assumes only a 10 percent depreciation of the real effective exchange rate, resulting in a 15 percent decline in the domestic price of rice during the five-year period. Scenario C assumes no depreciation of the exchange rate, so that the domestic price of rice falls by the full 23 percent needed to bring it to the import parity level within the current policy framework. Clearly, in the absence of exchange rate movement, pricing scenarios A, B and C can be achieved through liberalization coupled with import tariffs of 20, 11, and 0 percent, respectively. However, Bangladesh would lose the general export promotion effect gained through reduction of the real effective exchange rate--as well as losing the long-run export orientation needed in the rice sector to ensure efficient growth.

#### The Impact on Supply

76. In the absence of other changes, a lower rice price will reduce the profitability of rice production. However, analysis of scenarios A, B and C indicate that even with a 15 percent decline in the price of rice, the cash returns to land and family labor are positive for all varieties of rice, and remain more attractive than for most alternative crops examined. Based on various estimates of supply response, such a reduction in output price could trigger a reduction in production of anywhere from 1 to 6 percent, all else being equal. However, this negative impact on profitability would be countered by the positive impact of declining production costs, as irrigation technology and HYVs

are adopted. Green revolution technology reduces production costs and raises the return to family labor for rice production. A study by Hossain found that the adoption of HYVs reduced production costs by 20 percent and raised the returns to family labor by 64 percent when compared with traditional varieties.<sup>10/</sup> Furthermore, it was found that these benefits accrued to all farmers, regardless of farm size. In the past decade, the dissemination of green revolution technology has shifted the supply curve rapidly outward, so that production has expanded even as the real price of rice has fallen. One can expect this to continue in coming years, as long as input availability is maintained through liberalization and privatization of distribution systems. Thus, a reduction in the price of rice--with its positive impact on consumer welfare--would have a negative impact on production that would be countered by declining production costs. The net impact on production would be small. Furthermore, given that most producers in Bangladesh are net consumers of rice due to the small size of their holdings, lower rice prices would also transfer income from large farmers to small farmers.

77. A 23 percent decline in the domestic price of rice--equivalent to trade liberalization in the absence of exchange rate movement or appropriate tariff policy--results in some aus and boro production looking unattractive relative to alternative crops. This finding reinforces an earlier point: to avoid discouraging aus and boro production in some areas of the country, trade liberalization must be coordinated with appropriate tariff and exchange rate policy.

#### The Impact on Demand

78. Lower rice prices would increase aggregate demand and raise consumer welfare in Bangladesh. Demand projections which incorporate the effect of lower rice prices indicate that an 8 percent decline in the price of rice over five years (scenario A) would increase demand by 5.8 percent, reducing--but not eliminating--the country's technical potential for surplus rice production. A 15 percent decline in price (scenario B) would increase demand by 11.4 percent, and would maintain the country's technical potential for rice self-sufficiency. The scope for surplus production would be limited, however. A 23 percent decline in the price of rice over five years results in a 19.4 percent increase in demand, and would necessitate rice imports to overcome the supply-demand gap. This was clear from the earlier analysis of market protection: trade liberalization without tariffs or exchange rate movement would result in a flow of imports into Bangladesh. Perhaps most striking in this analysis is that an 8 to 15 percent decline in the domestic price of rice appears consistent with the country's pursuit of rice self-sufficiency, yet allows consumers to benefit from a significant decline in the price of their staple commodity. Given the dominance of rice in the consumption pattern of the poor, and the country's limited capacity to implement targeted distribution programs, it is undeniable that lowering the price of rice in the domestic market is the most effective way to improve the welfare of the poor in Bangladesh. For the poorest decile of the

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<sup>10/</sup> Hossain, Mahabub, Green Revolution in Bangladesh : the Impact on Growth and Distribution of Income, University Press, Ltd., 1989, Dhaka.

population, a 15 percent decline in the price of rice would raise per capita foodgrain consumption by an estimated 12 percent, and provide an extra 72 Kcals. per day in the average diet. This kind of broad-based improvement in consumption cannot be matched through targeted programs.

79. Bangladesh is an efficient producer of rice, and consumers should derive maximum benefit from this efficiency in the form of lower prices for their staple commodity. Trade liberalization, coupled with appropriate tariff policy or exchange rate movement, would be the fastest means of bringing this about. Concerns that lower prices (up to 15 percent lower) would not provide adequate incentives for domestic production, or would threaten the financial viability of small farmers, are not borne out by this analysis. As Bangladesh approaches self-sufficiency in rice production, the Government needs to adopt policies that facilitate, rather than impede, the resulting decline in rice prices. Cheaper rice was, after all, the primary goal of the green revolution. In particular, adjustment of the existing rice price stabilization policy is needed, a topic which will be examined in Chapter IV. Recent Government attempts to support domestic rice prices through procurement at a price which is well in excess of the export parity price has proven to be an unsustainable budgetary burden, an unnecessary incentive for rice production, and an undesirable tax on consumers-- particularly the poorest consumers for whom the price of rice is a key determinant of nutritional status. If Government wishes to play an active role in price stabilization, the official price band at which the Government intervenes in the market must be brought into alignment with the long-run trend in world prices, regardless of the stabilization mechanism used. This is so for reasons of economic efficiency, fiscal management and, above all, the nutritional well-being of poor consumers.

## CHAPTER IV

### Rice Price Stabilization

#### Why Stabilize Rice Prices?

80. A wealth of literature on commodity price stabilization suggests that the economic benefits for consumers and producers on the aggregate level tend to be small relative to the efficiency losses and budgetary costs associated with Government stabilization efforts. Furthermore, the marginal benefit declines relative to the costs as the degree of price stabilization increases. Indeed, it is sometimes argued that consumers gain from price fluctuation, rather than stabilization, because the area gained under the demand curve when the price decreases is greater than the area lost when the price increases. Likewise, producers gain from price fluctuation because the area gained above the supply curve when the price increases is greater than the area lost when the price decreases. However, the justification for stabilization may lie more in its assumed reduction of risk than in its impact on average income levels. No evidence is available to indicate the relative weight that consumers and producers in Bangladesh attach to price risk for rice, but risk reduction may be the overriding concern for poor consumers and producers who face a severe capital constraint.

81. On the consumer side, the poorest 40 percent of households in Bangladesh spend 70 percent of their income on food, of which about 60 percent is for basic foodgrains. Nonetheless, they are chronically undernourished, and face acute malnutrition, famine and even starvation in the event of an extreme price peak for their staple commodity, rice. These consumers attach a very high disutility to the possibility of experiencing high rice prices. Their aversion to the risk of high prices is much greater than their preference for low prices. In a societal sense, there is a high cost to "riding out" peak prices in terms of the long-run productivity of human capital. Thus, a strong case can be made for Government intervention to avoid extreme price peaks in cases where it is not profitable for the private sector to intervene.

82. The argument for public sector price stabilization is less persuasive with respect to the impact of downward price fluctuations on producers. It is argued that the aversion of poor producers to extremely low prices in the post-harvest period--carrying with it the risk of defaulting on loans and possibly losing land--is greater than their preference for high prices. Thus, price stabilization is seen as compensating for an imperfect capital market. However, there is very little evidence of farmers losing their land in this manner (this should not to be confused with growing landlessness due to high population growth and finite land resources). Public sector loans have generally been forgiven, and the private, informal credit market--while far from perfect--has proven quite flexible. For farmers, price stabilization is really of less importance than income stabilization. Price stabilization may, in fact, destabilize income by reducing the countervailing price movements associated with production shortfalls. Income stabilization in the presence of price fluctuations depends on the capacity for substitution into alternative, income-generating crops. It

is here that one can find a rationale for rice price stabilization in Bangladesh from the producer's perspective: although some scope exists for rapid substitution away from rice into jute and other rabi season crops, the extent of substitution is limited, and rice remains the predominant source of farm income for rural households in Bangladesh regardless of shifts in relative prices. For this reason, and to avoid price peaks that place poor consumers at nutritional risk, Government should be prepared to prevent extreme fluctuation of rice prices in the event the private sector is not financially motivated to do so. The extent to which the public sector would be called upon to intervene is a function of the variability of rice prices and the opportunity given to the private sector to respond to price signals in the market.

83. The need to stabilize consumer prices--or at least to prevent extreme price peaks--is all the more important because the majority of farm households in Bangladesh are net consumers of rice. A recent study by Quasem (1987) found that 75 percent of all paddy farmers participated in the rice market, selling between 25-30 percent of their output, regardless of farm size. However, small farms (which make up 70 percent of farms) sold the largest share of output in the immediate post-harvest season, and later bought back around 135 percent of what they had sold. For these net consuming households, expenditure on rice will vary as price varies, but to a lesser degree because the price elasticity of demand, although high, is less than unity. Price stabilization will reduce these fluctuations in expenditure. For large farms, where the household is a net producer of rice, price changes will generally be in the opposite direction from changes in output, causing the total value of market sales to vary less if prices are not stabilized than if they are.

84. Experience with public sector rice price stabilization in Bangladesh in the past few years has made it apparent that the system is in need of adjustment. In FY90, the Government sought to defend a floor price by directly purchasing all rice offered at the official procurement price (Tk 9070/MT) which was about 65 percent higher than the prevailing export parity price. The public sector absorbed nearly one million metric tons of rice, but was unable to keep market prices above the floor price. The Government intended to liquidate its rice stocks through open market sales in the lean season. However, a succession of four good harvests dampened seasonal price swings, making it impossible for the Government to sell its stocks at a price that covered the costs of purchase, transport and storage. Even subsidized ration sales were sluggish due to donor-stipulated ration price increases and declining market prices. Public rice stocks deteriorated quickly due to their high moisture content and inadequate storage methods. They were of insufficient quality to export, and of limited value in targeted distribution programs. These public stocks proved to be a major financial drain on the food budget in FY90 and FY91. Ultimately, Government officials resorted to auctioning and highly subsidized rationing of rice, releasing it into the domestic market even as they procured additional rice to support producer prices in FY91. By mid-FY91, international events, political uncertainty and natural calamities had all served to increase rice prices in the domestic market, resulting in easier liquidation of excess public stocks. Nonetheless, Government has continued to procure large volumes of rice--and sustain losses in liquidating the resulting stocks--regardless of prices in the domestic market. Often, Government sells with one hand while buying with the other to serve contradictory food policy goals at an unsustainable cost to the

budget. Nor can this situation be dismissed as a temporary event. Rather, it is the natural result of changes in the production environment which have reduced the need for public sector price stabilization, and changed the relationship between the Government's official price band and the long-term trend in world and domestic prices. To understand these changes, one need only look at the evolution of rice price variability in Bangladesh during the past decade.

### Patterns of Rice Price Variability in Bangladesh

#### Interannual Price Variability

85. Bangladesh successfully stabilized domestic rice prices relative to world prices in the past decade, after a period of extreme volatility in the 1970s. Coefficients of variation for domestic prices in the 1980s were far lower than they were for world prices, unlike the previous two decades when the variability of domestic and world market prices was closely matched. In fact, correlation coefficients for domestic and world price movements were approximately .90 for both the 1960s and 1970s, dropping to only .12 in the 1980s as domestic prices stabilized. Decomposition analysis of rice price variability in the past thirty years indicates that the increased stability of domestic production was the major factor in reducing price variability in recent years.<sup>1/</sup> As discussed in Chapter II, adoption of green revolution technology has allowed irrigated boro cultivation to compensate for flood losses in the monsoon season, leading to a decline in the interannual variability of foodgrain production and per capita production. Increased production in the dry season has therefore reduced interannual price variability, and consequently, the need for Government price stabilization from year to year. It also contributed to a 30 percent decline in the real price of rice in Bangladesh between 1975-77 and 1988-90, while the real price of rice in the international market dropped by 50 percent.

86. More effective use of imports was a positive, but far less important, factor in reducing rice price variability in recent years. Per capita foodgrain availability was more stable than per capita production, implying that the Government effectively used imports to smooth fluctuations in domestic production and demand (Table 4.1). The Government monopoly on foodgrain trade prohibited the private sector from playing this role, and kept rice prices stable, but at a higher level than would have prevailed under a free trade regime.

#### Seasonal Price Variability

87. Increased production in the dry season has smoothed the seasonal pattern of foodgrain availability and price variability. This is evident from an analysis of price series that separates seasonal fluctuations from trend-cyclical and irregular fluctuations.<sup>2/</sup> An index of pure seasonality can then be calculated

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<sup>1/</sup> See Annex 6 for the results of the decomposition analysis.

<sup>2/</sup> The decomposition of nominal prices into trend-cyclical, seasonal and irregular components is done using the X-11 approach developed by the National Bureau of Economic Research. The approach is based on the ratio-to-moving average technique, as described in Ahmed and Bernard, op.cit.

Table 4.1: Variability of Rice Prices and Foodgrain Production and Availability, 1960-89

	Coefficient of Variation <u>1/</u> (in percent)		
	1960-69	1970-79	1980-89
Nominal rice prices			
domestic <u>2/</u>	6.3	17.9	5.1
world <u>3/</u>	4.9	18.5	11.0
Real rice prices			
domestic <u>4/</u>	5.6	15.8	6.7
world <u>5/</u>	4.5	17.3	11.2
Foodgrain Production	8.7	10.2	7.5
Per Capita Foodgrain Production	5.3	5.7	3.5
Per Capita Foodgrain Availability	n.a.	n.a.	2.7

1/ Coefficient of Variation =  $\frac{\text{Mean}}{\text{Standard Deviation}} \times 100\%$

2/ Average wholesale price of coarse varieties.

3/ Thai 5 percent broken.

4/ Deflated using the nonfood CPI for Dhaka, middle income consumers.

5/ Deflated using the G-5 MUV.

for the period 1960-90 which captures the seasonal effect on prices as deviations from the trend-cyclical plus irregular components. As seen in Figures 4.1 and 4.2, the index has changed from a predominantly unimodal pattern in the 1960s--with one price peak before the aman harvest, and one price trough following the aman harvest--to a bimodal pattern with two distinct peaks/troughs, one associated with the aman harvest and another with the boro harvest. The extent of seasonal fluctuation has decreased markedly, as well: the range of the index declined by 25 percent from the 1970s to the 1980s. In terms of nominal prices, the seasonal spread from lowest to highest price within a year has declined substantially, from an average of nearly 30 percent in the 1960s and 60 percent in the 1970s, to only 20 percent in the 1980s. Clearly, the production environment in which Government stabilization policy operates has changed significantly in the past twenty years, reducing the need for seasonal price stabilization. This has been a major factor in recent financial and stock management problems associated with food operations.

Figure 4.1: Seasonal Index of Rice Price Variability, 1960-89

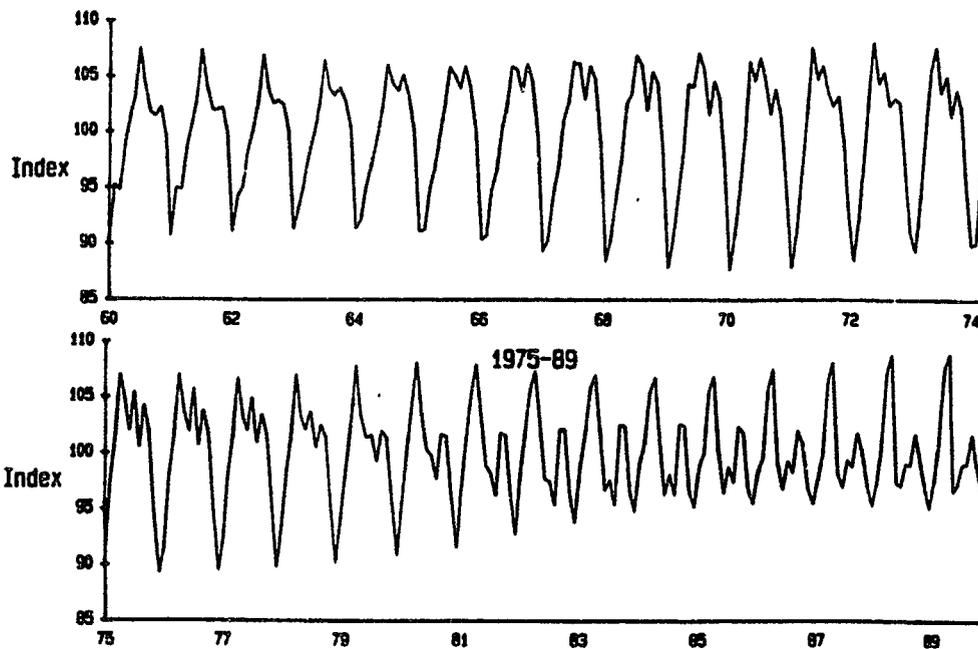
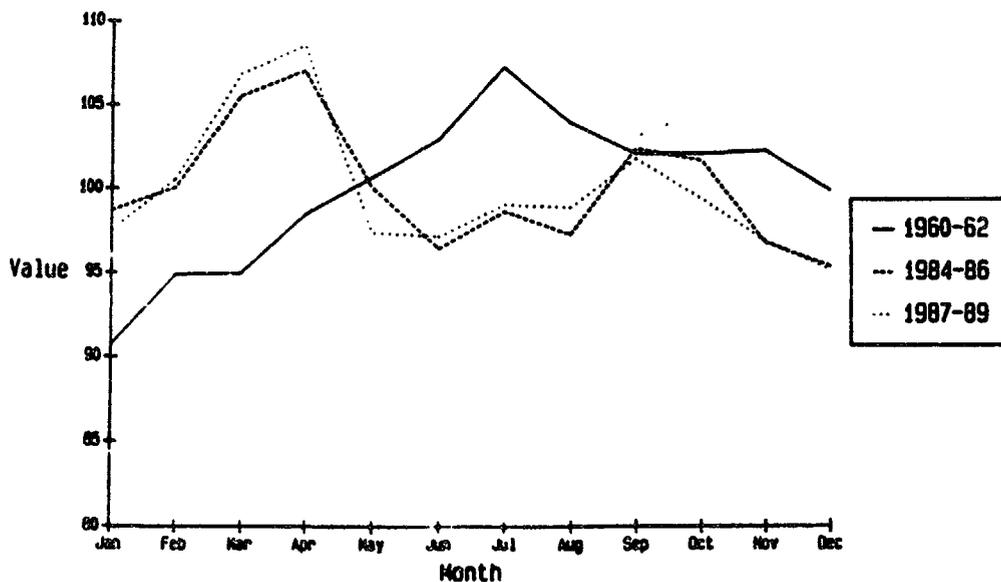


Figure 4.2: Seasonality of Rice Prices, 1960-62, 1984-86 and 1987-89



### Regional Price Variability and Market Integration

88. In support of regional price stabilization, it is argued that prices at harvest time in surplus zones tend to plummet, if only for a limited period, because poor, indebted farmers are obliged to sell their crop--often to the person to whom they owe money--at the very time when prices are lowest. It is also argued that speculative pressures are likely to intensify during the lean season in deficit zones, causing sudden price peaks which place the poor at severe nutritional risk. The assumption is that the rice market in Bangladesh is not sufficiently integrated and competitive to avoid these price extremes, and that there are additional imperfections in input and capital markets that raise production costs for the poor, resulting in unmanageable debt burdens. The imperfections in input and capital markets are undeniable, but there is considerable debate over the degree of integration and competitiveness in the Bangladeshi rice market.<sup>3/</sup> Analyses based on price correlations for paired markets or on evaluation of marketing margins generally conclude that the market for rice is quite efficient and competitive. However, most of the available data on prices and margins tends to come from the more dynamic market centers, and may, therefore, overstate the degree of integration and competitiveness in the market as a whole. Tests of short-run integration also indicate that the majority of markets are poorly integrated with the central market during the monsoon season, and that those areas with underdeveloped infrastructure--particularly the aman surplus areas in the Northwest--appear to be more isolated year-round.<sup>4/</sup> Studies by Crow and others have also documented oligopolistic and oligopsonistic market structures, although in some cases, price data do not seem to reflect oligopoly rents.<sup>5/</sup> In the more underdeveloped areas, tenants and sharecroppers often face interlocking land, input and capital markets dominated by a landlord or local trader. Overall, the picture that emerges is of a relatively competitive and integrated rice market, but with identifiable areas of seasonal segmentation and isolation. Government stabilization efforts need to target these seasonally segmented and/or particularly underdeveloped areas, increasing supply or demand as needed through either direct purchases/sales or through incentives for greater private sector trade.

89. Changes in the production environment brought about by the dissemination of green revolution technology have clearly altered patterns of rice price variability, and reduced the need for Government price stabilization on both an annual and seasonal basis. At the same time, improved infrastructure has increased market integration. These changes have brought to the fore certain weaknesses in the Government's stabilization mechanism that will be addressed below. It is useful, before examining the current system and alternative

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<sup>3/</sup> For an overview of works on this subject, see Q. Shahabuddin, "Product and Factor Markets in Agricultural Production in Bangladesh", Bangladesh Institute of Development Studies, 1989.

<sup>4/</sup> Ahmed and Bernard, op. cit.

<sup>5/</sup> Crow, Ben, "Plain Tales from the Rice Trade: Indications of Vertical Integration in Foodgrain Markets in Bangladesh", The Open University, 1987.

stabilization schemes, to briefly review the experiences of other developing countries with commodity price stabilization.

### Commodity Price Stabilization in Developing Countries: Lessons Learned

90. Virtually every major rice-producing or -consuming country attempts to buffer its domestic market from short-term fluctuations in world prices, and many try to smooth regional and seasonal price swings in the domestic market, as well. The most common stabilization mechanism in South and Southeast Asia is use of a buffer stock, which is of necessity characterized by government restriction of trade. A comparative review of eight Asian countries found that all governments operated buffer stocks for rice, and had either a monopoly on rice imports/exports, or resorted to quantitative restrictions.<sup>8/</sup> In most cases, operation of the buffer stock is linked to some form of price support for producers, while only a few countries explicitly strive to defend a price ceiling. All have, however, some form of targeted distribution program, either through rationing or food stamps. Independent marketing boards are used as another stabilization mechanism, seen most frequently in Africa. A third possibility is to stabilize prices through variable taxation of trade. This most commonly takes the form of a stabilization fund which allows the government to influence domestic price without handling the commodity itself. This type of mechanism is used for a variety of import and export commodities in countries as diverse as South Korea, Malaysia, Papua New Guinea, Ivory Coast, Chile and Columbia.

91. A recent World Bank report examined the implementation of different stabilization mechanisms for various commodities in 37 developing countries, in order to distill this experience into some generalizable policy recommendations.<sup>7/</sup> The authors concluded that a frequent problem plaguing stabilization schemes is that they tend to be used to achieve multiple goals. While the explicit goal is price stabilization, there are often implicit goals which seek to alter the average price level and redistribute income among consumers, producers and Government in politically desirable ways. The stabilization mechanism often becomes the focus of pressure groups, resulting in the adoption of financially unsustainable pricing policies. In particular:

Governments have frequently been pressured by rural interests to keep procurement prices high, while urban interests pressed to keep retail prices low for staple commodities. As long as the subsidies could be financed through debt accumulation, with adverse effects hidden, governments were free to ignore basic economic considerations and to follow the schizophrenic policy of high producer prices and low consumer prices.<sup>8/</sup>

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<sup>8/</sup> Consultants report: Umali, Dina, Rice Price Policy in South and Southeast Asia: A Country and Regional Study, unpublished, January, 1991.

<sup>7/</sup> Knudsen, Odin and Nash, John, Domestic Price Stabilization Schemes in Developing Countries, October 1988.

<sup>8/</sup> Knudsen and Nash, op. cit., page 8.

92. Often this type of pricing policy creates disincentives for private sector trade, transport and storage, all of which are needed for effective price stabilization. This then leads to even greater government intervention to substitute for private sector trade. In addition, as public sector storage and transport replace that of private traders, costs of storage and transport are likely to rise due to government inefficiency. Governments sometimes set the target price band in relation to the "cost of production", but actual costs of production vary tremendously, and the marginal producer will always have a cost of production equal to whatever target price is selected. Thus, this criterium is virtually meaningless as a basis for setting target prices. When this or other criteria are used which do not take into account the long-run opportunity cost of the commodity (as reflected by the long-run trend in world price for a tradable commodity), the result is misallocation of resources in the economy coupled with potentially costly and/or ineffective stabilization efforts. Both cost and effectiveness are greatly affected by the position of the price band relative to the long-run trend in world prices, though the direction of these effects depends on the mechanism employed:

For a buffer stock or marketing board:

(i) if the price band is too high, purchases will continue until physical storage facilities and/or financial reserves are exhausted. Surpluses will have to be disposed of at a loss over and above the cost of storage;

(ii) if the price band is too low, price stabilization will cease as soon as stocks are exhausted. The cost will be relatively low, but little stabilization will occur.

For a stabilization fund:

(i) if the price band is too high, and the commodity is being imported, stabilization will be achieved through a variable import levy, which will generate budgetary revenues. However, if the commodity is being exported, stabilization will be achieved through a variable export subsidy, which will be a cost to the budget;

(ii) if the price band is too low, and the commodity is being imported, stabilization would be achieved through a variable import subsidy, which would be a cost to the budget. In contrast, if the commodity is being exported, stabilization would be achieved through an export tax, which would generate budgetary revenues.

93. A number of recommendations arise from this review of stabilization mechanisms throughout the developing world. First, governments should avoid handling the commodity directly, in order to reduce the budgetary burden of stabilization policy. For tradable goods, use of trade-based mechanisms, relying on variable taxation to stabilize prices, are effective in influencing domestic prices, and are far less costly than buying, storing, transporting and selling the commodity. Second, governments should seek to only partially stabilize prices, buffering the domestic market from extreme price movements only, through use of a price band. Any effort to stabilize rice prices will inevitably involve

costs to the government. The fact that the private sector does not act in a manner which achieves this degree of stabilization implies that it is not financially profitable. Net costs to government will be lower the wider one sets the band within which prices can vary. This is because the scale of interventions will be more limited, reducing the need for stocks or reserves. Most importantly, an excessive degree of stabilization will eliminate the incentives for private sector market participation. The private sector has the primary role to play in stabilizing market prices through regional transport, seasonal storage and international trade. However, the private sector can only play this role if the financial incentives accorded by seasonal, regional and international price differentials are sufficient to cover the costs of storage, transport and trade. The goal of stabilization policy, therefore, should not be the elimination of price variability, but rather the protection of the domestic market from extreme, short-term price movements, and the elimination of constraints on trade, market access and market integration which prevent the private sector from responding to price signals.

94. A third recommendation is that target prices should approximate long-run average market prices; the world market price is the appropriate reference for a tradable commodity. Target prices which are consistently out of line with long-term trends will lead to: (i) continual accumulation of stocks or reserves, or exhaustion of budgetary resources without achieving stabilization; (ii) inefficient allocation of resources; and (iii) potential squeezing out of private sector activities. Finally, the fourth recommendation, given the costliness of stabilization efforts and their relatively small benefits empirically, is to rely as much as possible on market forces to stabilize prices. To do so, the policy environment for the private sector must encourage a competitive and well-integrated market. The experience of other countries in applying some of these guidelines can be instructive in making the stabilization mechanism in Bangladesh more effective, financially self-sustainable and compatible with increased private sector activity. Papua New Guinea, for example, has adopted a trade-based system of price stabilization for copra, coffee, palm oil and cocoa. For cocoa, a variable levy system--with the marginal rate increasing along with world price up to a maximum of 50 percent--was initially coupled with a support price scheme based on cost of production. In 1977, however, cost of production was rejected as the basis for setting target prices because production costs had proven highly variable, and the price band adopted was consistently below the long-run trend in the world market, imposing an unnecessary tax on producers and leading to sub-optimal allocation of resources in the sector. Thus, the Government moved to a system of market-determined target prices, based on a ten-year moving average of world price, adjusted for inflation. The variable levy was then set equal to half the difference between the ten-year moving average and the current world price. In this way, domestic price instability for cocoa has effectively been reduced by more than 45 percent, while Government has avoided handling the commodity directly and has maintained a self-financing system. Indonesia, while retaining a buffer stock system for rice, has recognized the need to set target prices in relation to long-run world market prices, and to only partially stabilize domestic prices, keeping the price band wide enough to provide adequate incentives for private sector activity. Thailand maintains some public buffer stocks, but relies much more heavily on regulation of trade to effectively stabilize domestic rice prices. Both adjustable trade tariffs and mandatory rice reserve requirements for private traders have been used to

influence domestic price without having government intervene directly in the rice market.

### Private Sector Price Stabilization in Bangladesh

95. In Bangladesh, there are well-documented rigidities and imperfections in the agricultural input, capital and output markets which inhibit private sector storage, transport and trade. Thus, any discussion of rice price stabilization must focus first and foremost on the policy reforms and development initiatives needed to eliminate or reduce the constraints on private sector price stabilization. These include measures to increase the stability of rice production and encourage private sector foodgrain storage, transport and trade. Of highest priority are:

- (a) abolition of the "anti-hoarding laws" which restrict storage and interdistrict movement of foodgrains;
- (b) elimination of the prohibition on credit for foodgrain storage, pilot programs linking foodgrain storage to credit for poor farmers;
- (c) continued liberalization of agricultural input markets, not just for diesel engines and fertilizers, but for pumps, piping and improved seed varieties;
- (d) research and extension to close the gap between actual and potential yields on existing HYVs, and to develop better-adapted varieties that will allow more crop cycles or greater use of marginal lands;
- (e) implementation of a flexible exchange rate policy;
- (f) rental of public sector bulk storage to the private sector to facilitate import/export;
- (g) promotion of private sector external trade through diplomatic channels.

96. Government price stabilization is not a substitute for these policy reforms and development activities. Nor should the public sector stabilization mechanism itself discourage the private storage, transport and trade needed for market-driven price stabilization. However, recent changes in the pattern of price variability in Bangladesh have exacerbated weaknesses in the current buffer stock system of price stabilization that have made it: (i) largely ineffective; (ii) economically inefficient; (iii) financially unsustainable; and (iv) potentially detrimental to private sector price stabilization efforts.

### Weaknesses in the Current Buffer Stock System

#### Effectiveness

97. The current buffer stock system was not designed to stabilize rice prices, but rather to assure adequate distribution of foodgrain through the ration

program. The quantities bought and sold through the domestic procurement and open market sales channels have been quite small relative to domestic production, domestic supply and the distribution of foodgrains through the ration system (Table 4.2). There is inherent conflict in the dual role of the procurement price which is to supply the public distribution system (a function which requires a relatively fixed quantity of procurement) and, at the same time, to support prices at harvest time (a function requiring flexibility in the quantity purchased from year to year). Domestic procurement has been ineffective in guaranteeing a floor price to poor farmers, particularly in more remote areas, many of which are the major surplus production areas.<sup>2/</sup> Producers generally receive far less than the procurement price, with the difference accruing to the traders and millers from whom the Government purchases. It is acknowledged that the benefit to farmers lies solely in the stimulus provided to aggregate demand, not in the direct transfer of the procurement price to the producer level. However, in order to effectively support the procurement price, public buying would have to be increased far beyond the one to five percent of production now purchased. Even the Government's ability to effectively support prices in the more accessible areas of the country is open to question given the limited scale of public purchases. As an example, despite the quantum jump in procurement in FY90--more than triple the level procured in every year since 1978--average wholesale prices in almost all districts were well below the procurement price after the aman harvest in November/December 1989. Under these circumstances, the actions of the Government may exacerbate, rather than ameliorate, the problem of low prices at harvest time. Knowing that the Government will not be able to support market prices for long, private traders hold off their normal purchases, waiting for prices to break so that they can buy after prices drop. Only the Government ends up purchasing grain at the artificially high procurement price and then incurring a loss, as it did in FY90 and FY91, by having to pay for storage costs and then destock at prices much lower than the procurement price. In view of the Government's inability to support producer prices under the current system, there appears to be little benefit for producers.

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<sup>2/</sup> Approximately three-quarters of total procurement occurs in the Northwest region (Rajshahi Division) of the country because of the large surpluses generated there. This is the region, therefore, in which one might expect the Procurement Price to have operated most effectively as a support price. Yet an examination of average wholesale prices by district over the past 10 years reveals many instances in which the prices here were lower than the Procurement Price. They were often lower still in other regions, and were of course lower to farmers than at the wholesale level. Food Planning and Monitoring Unit, Compendium of Statistics on Foodgrain Supplies, Prices, Agricultural Inputs, and Agrometeorology, November 1986; Department of Agricultural Marketing data.

Table 4.2: Domestic Procurement and Open Market Sales, 1980-90

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
<b>(000 MT)</b>											
Procurement	280	854	289	168	148	134	219	137	289	359	919
Open Market Sales (OMS)	n.a.	n.a.	110	37	57	45	90	144	125	167	20
<b>(in percent)</b>											
Procurement/ Production	1.8	6.2	2.1	1.2	1.0	0.9	1.5	0.9	1.9	2.3	5.0
OMS/Supply <sup>1/</sup>	n.a.	n.a.	0.8	0.3	0.4	0.3	0.6	0.9	0.8	1.1	0.1

<sup>1/</sup> Supply equals production plus distribution minus procurement.

98. Likewise, gains to consumers are few, as well. The major mechanism for stabilizing prices under the existing system is open market sales (OMS), which have never amounted to more than 170,000 MT per year, or less than one percent of total supply. Average wholesale prices for coarse rice have exceeded the OMS price in every single year since FY82. If one examines the monthly figures by district, it is clear that in every year in which open market sales of rice have exceeded 100,000 tons, the average level of wholesale prices in practically every district has been higher than the OMS price, particularly several months after the harvest. Thus it appears that the Government's efforts to put a ceiling on wholesale prices in years of shortage have generally failed, though there have certainly been instances in which the Government was able to dampen sharp price increases in limited areas. The anticipated failure of OMS to maintain a ceiling on prices may cause private traders to buy at the OMS price and hold grain until they can resell it on the open market at a profit. Attempts by the Government to stabilize prices thus encourage traders to take action that drives prices up. Nonetheless, as discussed earlier, the Government has helped to stabilize rice prices through its general import policy, which serves mostly to supply the rationing system. If the distribution of imported foodgrains through the ration system as a whole partially substitutes for purchases of local rice by consumers on the private market, some downward pressure on private market prices will be maintained.

### Efficiency

99. Since there is little evidence that the current system of domestic procurement and open market sales exerts a significant effect on producer or consumer prices for rice, the major losses from economic efficiency occur not because prices are distorted at the margin but because the two-tiered structure of prices (official prices and market prices) induces inefficient rent-seeking behavior. These rents are equal to the difference between the price at which the

Government buys or sells rice and the price prevailing on the private market. Economic inefficiency arises because of the competition that prevails in order to gain access to these rents. Much effort will be devoted to influencing public officials, leading to corruption and a waste of otherwise productive resources. In addition, one must take into account the bureaucratic inefficiency of buffer stock management. Analysis of operational efficiency clearly indicates that the public sector has been highly inefficient relative to the private sector in importing, handling, transporting and storing large volumes of foodgrain (see Chapter VI).

### Financial Sustainability

100. The budgetary cost of the existing buffer stock system has been sizeable. It is difficult, however, to distinguish between the costs that are related to price stabilization and those that are linked to the effort to target the poor and other groups. If one looks simply at the net cost of domestic procurement and OMS (excluding associated operating costs), one finds a deficit in all but one year of the past decade. This deficit on stabilization operations widened as the decade progressed, peaking in FY90 at nearly Tk 8.2 billion. This is a direct result of: (i) the recent policy decision to use the procurement price as a price support for producers; and (ii) the drift upward of the Government's target price band relative to domestic and world market prices. The procurement price was initially established for the purchase of a finite volume of foodgrain with which to supply the distribution program. No assessment was made of the financial implications of using this price as an open-ended price support for producers. However, during the past fifteen years, the Government's target price band--with the procurement price as the floor and the OMS price as the ceiling--has declined in real terms, but risen relative to the sharper declines in domestic and world market prices brought about by the green revolution. As the target price band has increasingly deviated from long-run trends in market prices, stabilization has grown more costly and less effective. The Government engages in massive procurement, exhausting both financial resources and storage capacity, to support a floor price which is well in excess of the export parity price. Indeed, it is even in excess of the import parity price. Officially, the OMS price is supposed to be fixed at 15 percent higher than the procurement price (20 percent in areas with Statutory Rationing). Thus, if the procurement price is too high, the OMS price will also be too high, given that the seasonal swing in prices has been reduced to only around 20 percent due to the increase in dry season production. Implicitly, Government has attempted to overcome this problem by squeezing the 15-20 percent margin between floor and ceiling prices down to as little as two percent. While this facilitates stock disposal, it increases budgetary losses and reduces incentives for private sector storage. The Government now finds itself in a position where it must turn over public rice stocks within 3-4 months or risk serious stock deterioration, even though seasonal price swings no longer warrant the intervention.

101. The Government's two-tiered pricing structure also increases the cost of stabilization beyond what it would be if the Government had procured and sold rice at the market price rather than at the official procurement and OMS prices. This assumes that neither of these actions would have influenced market prices any differently than existing practices. While not strictly true, especially in the short run, the size of these operations relative to total marketing is such

that the assumption is not a bad approximation. In principle, to assess the cost differential, a separate market price should be utilized for each transaction and that price should be specific with respect to the location and time that the transaction took place. However, for purposes of illustration and to get some idea of the orders of magnitude, one can multiply the quantity procured in FY90 (919,000 MT) by the average wholesale price prevailing in the Northwest region for two months after the aman and boro harvests (Tk 8713/MT). On this basis, the average loss from procuring at the official price instead of the market price was Tk 348/MT, for a total loss of approximately Tk 320 million.

#### Impact on Private Sector Price Stabilization

102. One of the dangers associated with Government intervention in foodgrain markets is that it will reduce seasonal price variation to the point where it eliminates the incentives for private sector storage. With seasonal price swings already reduced to only around 20 percent, Government finds it difficult to turn over its rice stocks at the OMS price. Sales at any price--such as the auctioning done in FY90--will further reduce seasonal price swings, dampening the incentives for private sector storage on a seasonal basis. Estimates of storage costs vary depending particularly on the assumed cost of capital, but all imply that private sector traders need at least a 20 percent seasonal mark-up to cover their costs. Government sales which further squeeze the seasonal swing will prevent the private sector from playing its role in price stabilization.

#### Alternative Stabilization Schemes

103. From the preceding analysis, three priorities emerge. First, all restrictions on private sector transport, storage and trade which inhibit market-driven price stabilization should be abolished. This includes permanently abolishing the "anti-hoarding laws" and eliminating the prohibition on extending credit for foodgrain storage. Second, the Government's target price band needs to be adjusted downward to bring it into line with the long-term trend in world prices. This is so for reasons of economic efficiency, fiscal management and consumer welfare. Keeping the target price band in alignment with the long-run opportunity cost of rice (as measured by the trend in world prices) ensures that the stabilization mechanism promotes an efficient rice sector in Bangladesh. It will redress the current imbalance between procurement and sales, eliminating the unnecessary and financially-draining levels of procurement seen in recent years. It will also facilitate the reduction in domestic rice prices that is the natural outcome of the green revolution. The third priority, once the price band is adjusted, is to restore an adequate margin between floor and ceiling to cover Government handling costs and provide adequate pricing differentials for private sector storage and transport. In recent years, the margin has been squeezed to as little as two percent, as Government sought to stimulate sales of public stocks by keeping the OMS price down.

104. These three measures are of highest priority, regardless of the stabilization mechanism used. In addition, reform of the stabilization mechanism itself is warranted. Two proposals have been advanced. The first is a modified buffer stock scheme which is largely associated with the work of IFPRI. The second is a trade-based system which relies on private sector trade and a public sector import/export stabilization fund. Both schemes would be complemented by

a public distribution system oriented toward providing targeted assistance to the poor, ensuring emergency relief to destitute areas and acting as seller of last resort in the event of exceptionally high market prices. Each scheme is assessed in terms of its benefits for producers and consumers, and its costs in terms of economic efficiency and budgetary expenditures. Ultimately, the choice of a stabilization mechanism and an appropriate price band within which prices will be stabilized depends on the perceived tradeoff between the benefits associated with a higher degree of stabilization and the costs which a narrower band entails. It also depends on the government's ability to maintain prices within that band, given its financial resources, management capability, and storage capacity. If these are not adequate for the task, attempted stabilization may be worse than no stabilization at all because private traders will be able to speculate on the inability of the government to maintain the band, raising the cost to the government and making it more difficult for stabilization to succeed.<sup>10/</sup>

#### Modified Buffer Stock

105. Several proposals have been made regarding the reorientation of the current public foodgrain distribution system towards one that would have price stabilization as its principal objective.<sup>11/</sup> Although there is some variation in the proposals made, the basic procedures involve: (i) use of a short-term model to predict the average annual price from forecasts of GNP and market supply; (ii) determination of a target annual price by applying a rule concerning the maximum percent price band allowed in real annual prices adjusted for trend; (iii) conversion of the real target annual price to nominal target seasonal prices; and (iv) estimation of the quantities of procurement and distribution required to keep actual prices within the nominal target seasonal price band. This set of procedures improves upon existing practice in that it explicitly considers price targets, whereas the current buffer stock system concentrates principally on quantitative targets regarding how much grain is to be imported, procured locally, and distributed through the various public channels. However, there remains some ambiguity as to the use of official prices to achieve both price stabilization and subsidized distribution. There is inherent conflict in having one policy instrument available to achieve two objectives. This duo objective limits the usefulness of these prices as a policy tool to achieve price

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<sup>10/</sup> An interesting study for the World Bank of grain stabilization schemes in Bangladesh, India, Indonesia, Pakistan, and the Philippines suggests that those schemes that have worked best have not been very ambitious in their attempts to influence prices. [cite reference]

<sup>11/</sup> Ahmed and Bernard, Rice Price Fluctuation ..., pp. 56-71; Quazi Shahabuddin, The Report on a Disaggregated Model for Rice Price Stabilization in Bangladesh, Food Policy Project: Bangladesh, International Food Policy Research Institute, June 23, 1990. These two proposals are similar in approach but differ in some of their details. The Shahabuddin model, for example, uses quarterly data, whereas the Ahmed and Bernard model is based on annual series. Here we try to summarize the major thrust of the common approach without getting into the specifics of differences in the models.

stabilization. In the analysis that follows, this problem is assumed to have been solved, allowing the buffer stock arrangement to effectively stabilize prices within the proposed price band. For purposes of illustration, the income effects that would have resulted from implementation of this scheme in FY90 are calculated.

106. Benefits to Producers. The benefits to producers consist of the welfare gains associated with reduced risk of price fluctuations, but not with reduced risk from income fluctuations because of the tendency for price and output to move in opposite directions. There are no measures of welfare gains that farmers might experience from reduced risk of price fluctuations, but it is possible to estimate the effect on income that reduced price variation would have had for different kinds of farmers in FY90. Table 4.3 shows imputed farm income for six different farm types in the Northwest Region, where about three-quarters of Government procurement occurs.<sup>12/</sup> The minimum procurement price that would have applied in FY90 if the proposed buffer stock arrangement had been in effect would have benefitted farmers relative to the market prices that prevailed that year.<sup>13/</sup> Both fall short of the potential impact of the existing procurement price, but Government has never been successful in defending this price in the market, anyway. It must be remembered, however, that under a pure buffer stock arrangement, the gains from supporting prices would be counterbalanced by losses of approximately the same magnitude when market prices rose to the ceiling. Otherwise the Government would be operating simply a price support program rather than a stabilization scheme.

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<sup>12/</sup> See Annex 9 for a description of farm types and income estimates.

<sup>13/</sup> It is assumed here that the proposed buffer stock arrangement would intervene when the market price fell 12 percent below the existing procurement price. The procurement price represents the trend price around which a 4 percent annual deviation plus an 8 percent seasonal deviation are allowed to occur within the price band established for the buffer stock. These are the deviations proposed in Ahmed and Bernard, Rice Price Fluctuation ..., pp. 64-65.

Table 4.3: Estimated Imputed Farm Income Valuing Rice  
According to Three Price Scenarios, 1989-1990  
(Tk/farm)

Farm Type (a)	RICE PRICE			Income Difference (3-1)
	(1) Market Price	(2) Prevailing Procurement Price	(3) Minimum Procurement Price (b)	
<b>Small</b>				
Undeveloped	578	1,122	821	243
Developed	1,451	3,507	2,370	919
<b>Medium</b>				
Undeveloped	2,381	4,877	3,496	1,115
Developed	8,247	15,417	11,451	3,204
<b>Large</b>				
Undeveloped	4,689	10,350	7,218	2,529
Developed	21,421	40,478	29,937	8,516

- (a) Characteristics of each farm are presented in Annex 9.  
 (b) Minimum price based on maximum downward allowance of 12 percent:  
 4 percent trend deviation and 8 percent seasonal variation.

107. Benefits to Consumers. Benefits to consumers are easier to measure insofar as the nutritional status of the poor is concerned. Analysis of data from the 1988-89 household expenditure survey suggests that both income and price elasticities of demand for rice are very high in Bangladesh, especially for the poor. The income elasticity for the poorest decile of the population is 0.9 and the price elasticity is -0.8.<sup>14/</sup> The average wholesale price for rice in FY88 was Tk 355/maund, compared with a procurement price of Tk 265/maund. If we assume, once again, that the procurement price was the trend price and allow a 12 percent deviation around the trend, then the maximum price under the proposed buffer stock scheme would have been Tk 297/maund, or Tk 58 less than the average market price. This difference would have resulted in 12.6 more kilograms of rice consumed per year and 79 more calories consumed per day for each person in the bottom decile of the population. These figures may be compared with an average of 95 kilograms of rice consumed annually and 1610 calories consumed daily by people in the lowest decile. While some of these people would have been assisted through the rationing system, most of the poor do not have access to these channels. It is for these people particularly that some way of capping upward price movements seems especially important. Although the benefits to this group

<sup>14/</sup> See Annex 8 for a description of the demand analysis undertaken through the Bangladesh Bureau of Statistics.

from the buffer stock scheme do not appear to be enormous in terms of increased calorie consumption, they nonetheless could be critical during peak price periods, given the low calorie intake of this group.

108. Economic Efficiency. There are efficiency costs that are almost inherent in a buffer stock approach. In particular, through its buffer stock operations, the Government will inhibit the development of private sector trade which would perform these operations far more efficiently. The model used to predict target annual prices does not allow for imports, presumably because they are assumed to remain a monopoly of the Government under this scheme. The failure to encourage private trading on the world market deprives Bangladesh of this built-in price stabilizer. Buffer stock operations may also discourage seasonal storage and regional transport by the private sector if too narrow a price band is established. Finally, the price band under this proposal is in no way linked to the long-run opportunity cost of rice, as measured by the trend price in the world market. In recent years, the price band under this proposal would have been higher than a price band established with reference to import and export parity prices under a liberalized trade regime. Significant deviation of the price band from the trend in world prices leads to misallocation of resources over the long-run, as well as making the stabilization mechanism more costly and/or less effective.

109. Budgetary Cost. Costs to the Government of a buffer stock scheme will depend very much on the width of the price band and whether or not it is closely aligned with the world trend price. If the band rises above the trend, costs can increase enormously as the buffer stock becomes a pure price support program. This was the case with the existing stabilization scheme in FY90. Ahmed and Bernard estimated the incremental costs of their proposed buffer stock scheme over and above the cost of the existing system during the 1976-84 period. On the basis of a price band that permits a 4 percent annual plus an 8 percent seasonal deviation from the trend in domestic prices, they estimated that the incremental costs would have totaled Tk 567 million per annum in 1986-87 prices, or approximately Tk 800 million in 1989-90 prices. However, both the existing and the proposed buffer stock schemes are costly to the budget relative to a trade-based stabilization mechanism in which the Government does not physically handle the commodity.

#### Private Sector Trade Plus Stabilization Fund

110. An alternative price stabilization scheme could rely on private sector trade and an import/export stabilization fund to tax/subsidize trade as necessary to achieve the desired degree of stabilization. The major advantage to this system is that it would encourage the private sector to carry out most domestic marketing and external trade, rather than the public bureaucracy. The major mechanism for price stabilization would be external trade, not Government operation of a buffer stock. To the extent that the country wished to insulate itself from extreme price fluctuations on the world market, this could be done through the operation of the stabilization fund.

111. The operation of the fund would depend on whether Bangladesh was an importer or exporter of rice in most years. If the country remained essentially

an importer, an annual target ceiling price would be set relative to the import parity price that would: (i) be acceptable relative to the nutritional need of the poor; (ii) generate a level of imports consistent with the balance of payments situation; and (iii) be financially sustainable within budgetary constraints. If, for example, the ceiling price had been set at the FY90 import parity price, an estimated 1.8 million MT of rice would have been imported by the private sector to fulfill domestic demand at that lower price. If the target price were set below the actual import parity price, private sector rice imports would receive a subsidy equal to the price difference. If the target price were set above the actual import parity price, rice imports would be assessed a tax equal to the price difference. Actual domestic market prices would then differ from the target price due to internal transport costs and seasonal variations in supply. During the harvest period, domestic supply would increase to the point that market prices would fall below the target price. No rice would be exported, however, unless the domestic price fell below the export parity price, in which case it would become profitable to export. As the season progressed, the market price would rise until it reached the target ceiling price, at which point further price rises would be prevented by an inflow of private sector imports.

112. If prices evolved in Bangladesh such that rice exporting began to look attractive, then the target floor price would become operational. The annual target floor price would be set relative to the export parity price at a level that would: (i) be acceptable in terms of cash returns to farmers; (ii) generate a level of exports consistent with the balance of payments situation; and, (iii) be financially sustainable within budgetary constraints. If the target floor price were set below the actual export parity price, rice exports would be assessed a tax equal to the price difference; if the target floor price were set above the actual export parity price, rice exports would receive a subsidy equal to this difference. During the harvest period, domestic prices would be supported at the target price and surpluses would be exported. As supply decreased after the harvest, the point would be reached at which there was no surplus, in which case no trade would take place and prices would rise. This price rise would be capped, however, by the target ceiling price fixed in relation to the import parity price. The major danger in this type of stabilization is if the target floor and ceiling prices are consistently set inside the import/export parity price band. This would lead to a continuous budgetary drain as exports were subsidized to maintain the floor price or imports were subsidized to maintain the ceiling price. Fortunately, in Bangladesh, the margin between import and export parity prices for rice is small, so that it would not be difficult to set a target price band that would remain outside the import/export parity band much of the time.

113. Macroeconomic management will have important implications for the evolution of the domestic rice market and stabilization of rice prices. Progress has been made in the 1980s in the area of exchange rate depreciation and the reduction of the anti-exporting bias resulting from import taxes and restrictions. These measures led to very rapid growth of nontraditional exports in the 1985-88 period, which slowed in the 1988-90 period as the currency appreciated. The growth of these exports, should it be sustained in the manner that has characterized other Asian economies, will result in substantial diversification and reorientation of the economy. Of particular importance for the rice subsector will be the growth of incomes that will be generated, initially

expanding the demand for rice, but subsequently resulting in a more diversified structure of food demand. This will lead to greater diversification and increased regional specialization of agricultural production. Although these changes may take some time, one must remember that rapid economic growth has characterized a number of Asian countries during the past few decades that were previously thought to be trapped in a binding web of poverty. It is important, therefore, to avoid recommending policies that will impede the process of longer-term growth and development. A trade-based stabilization system encourages the development of private sector trade in rice, a commodity in which Bangladesh has strong potential for efficient growth. The advantages of promoting an efficient rice sector, capable of exporting profitably to the world market are twofold: (i) domestic rice prices will be lower than if farmers were competing with imports, and this would benefit consumers--especially poor consumers--in a way that is impossible to achieve through distribution programs; (ii) price stabilization can be achieved relatively easily by assessing a variable tax on exports. These advantages are such that a long-term strategy oriented toward rice exporting is worth pursuing. This means abandoning Government efforts to prop producer prices far above import and export parity levels.

114. Benefits to Producers. Both the modified buffer stock scheme and the trade-based stabilization fund can effectively reduce the risk of price fluctuation for producers and consumers. The differences lie in how and where the target price band is set, the economic efficiency of the operation and the budgetary cost. The trade-based system depends on liberalization of the rice trade which could be expected to bring average consumer prices down toward the import parity level. On an aggregate level, this would reduce the profitability of rice production in the manner discussed in Chapter III. The impact that this would have on farm income in procurement zones can be assessed by once again looking at six farm types in the Northwest Region. In comparing Tables 4.3 and 4.4, it is apparent that because of high internal transport costs, the import parity price in the Northwest Region in FY90 would have been higher than actual market prices paid to producers or the procurement price proposed under the modified buffer stock system of stabilization. This is not surprising given earlier results showing most rice production to be highly competitive with imports at the farm level. It would even have been higher than the existing procurement price, which clearly was not paid to most producers. Likewise, because of high internal transport costs, the export parity price (US\$ 150/MT, FOB) in the Northwest Region is very low. If market prices fell to the level of the export parity price at the prevailing exchange rate, net farm income in the Northwest would be negative. However, it is almost inconceivable that domestic market prices would fall to this level in coming years, given local production capabilities. Rather, minimum market prices for producers in procurement zones will remain at profitable levels, between the import and export parity prices. The price support mechanism would not be called upon unless prices fell dramatically toward the export parity price. In the future, under a more flexible exchange rate regime, or at a higher quality reference price domestic rice prices could approach an export parity level that would look attractive for traders. Then a target price, set in the vicinity of the export parity price, would serve as floor price in years of surplus production.

Table 4.4: Estimated Imputed Farm Income With Valuing Rice  
According to Four Price Scenarios, 1989-1990  
(Tk/farm)

Farm Type (a)	RICE PRICE			
	Import Parity (\$150/ton)	Import Parity (\$200/ton)	Export Parity (\$150/ton)	Export Parity (\$200/ton)
<b>Small</b>				
Undeveloped	1378	1980	- 290	312
Developed	4474	6753	-1834	445
<b>Medium</b>				
Undeveloped	6052	8818	-1606	1160
Developed	18789	26734	-3204	4741
<b>Large</b>				
Undeveloped	13013	19286	-4354	1920
Developed	49444	70562	-9019	12099

115. Benefits to Consumers. The benefits to net consumers under trade-based stabilization would be greater than the benefits to net producers because, in addition to providing some measure of price stability, the scheme would result in lower average consumer prices. A comparison of the two target ceiling price implied by this scheme and the modified buffer stock arrangement analyzed above indicates that the two alternatives would have very similar effects on the price ceiling. In contrast, there would be substantial differences between the two schemes in their effects on consumers when prices were below the ceiling. The trade-based scheme would aim to lower the average level of consumer prices by encouraging a long-term export orientation, including improvements in the quality of domestic production and the lowering of processing and transport costs. If, for example, average consumer prices dropped to an import parity level of around Tk 7100/MT, consumers in the poorest decile of the population could be expected to consume an additional 20 Kg of rice per year and 125 more calories per day. Eventually, if consumer price fell to an export parity price of about Tk 5400/MT during at least a few months per year, these poorest consumers could be expected to consume an additional 3.8 Kg of rice per month and 260 more calories per day during this period. This would be a substantial improvement in their nutritional intake.

116. Economic Efficiency. Trade-based price stabilization would be far more efficient than a buffer stock scheme. First, the adjustment of target prices to long-run trends in world prices would ensure that domestic prices reflect reasonably well the long-run opportunity cost of rice. In this way, it would promote an efficient rice sector in Bangladesh. Second, it would rely on the private sector to engage in most marketing and trading activities, rather than an inefficient bureaucracy. By relying principally on international trade rather than on buffer stocks, public sector storage and handling costs would be greatly

reduced. By maximizing the private sector's role in price stabilization, the public sector role would be reduced accordingly. The Government would administer the stabilization fund, oversee the targeted distribution program, and provide relief to destitute areas. Any Government purchases/sales in the domestic market (to supply the distribution program, for example) would be at market, rather than official, prices, eliminating the two-tiered pricing structure, with its associated rent-seeking behavior. One potential inefficiency might be the additional foreign exchange reserves that would have to be held in order to meet unexpected demand for foodgrain imports. This loss of efficiency would not be great, however, and it would be largely offset by the decreased risk. Assuming risk reduction to be a valid national objective, along with maximizing economic efficiency, an optimal policy would be that which would trade off the least decrease in economic efficiency for the most reduction in risk. Trade-based stabilization is more efficient than a buffer stock in achieving a given level of risk reduction.

117. Budgetary Cost. The cost to the Government of this scheme would be very small relative to a buffer stock scheme because it would avoid the physical costs of handling foodgrains, and would reduce Government subsidies through realignment of the target price band to reflect trends in world prices. The cost of the stabilization fund itself would consist primarily of the difference between the rate of return on the reserves held against unforeseen fluctuations in international rice prices, and the rate of return that could be earned on these reserves for other purposes. If the target floor and ceiling prices were maintained well outside the import/export parity price band, so that the scheme would be managed more as a variable levy on exports and imports and less as a stabilization fund that would alternately subsidize and tax external trade, the cost to the Government could even be negative, i.e., the Government could earn revenue rather than incur costs. This of course implies that there would be less domestic price stabilization than if, on balance, tax revenues equaled subsidies.

#### Conclusions of the Analysis

118. Table 4.5 ranks the alternative stabilization mechanisms according to their impacts on producer and consumer welfare, as well as their economic efficiency and budgetary cost. The current buffer stock scheme exhibits weaknesses which are commonly found in stabilization mechanisms which: (i) rely on the Government to buy and sell commodities; (ii) have implicit income redistribution goals linked to stabilization goals; (iii) adopt financially unsustainable pricing policies; and (iv) set target prices without reference to the long-term trend in world prices. The scheme is inefficient and has done little to stabilize prices. Rice prices in Bangladesh have been stabilized in the past decade, but it is as a result of reduced fluctuation in domestic production and, to a lesser extent, Government's general import policy, rather than as a result of stabilization efforts. Thus, the impact of the current stabilization scheme on consumers and producers is minimal. Its major influence, instead, is to create a two-tiered pricing structure which provides abundant opportunities for rent-seeking behavior. Its cost to Government is very high because it passes profitable marketing opportunities on to a limited number of traders, and because the target price band has increasingly deviated from the declining trend in world and domestic market prices, leading to massive procurement at inflated prices coupled with sluggish liquidation of public stocks.

Table 4.6: Comparison of the Impacts of Alternative Rice Price Stabilization Schemes

	Current Buffer Stock	Modified Buffer Stock	Stabilization Fund
Producer Welfare	Low	Medium	Low
Consumer Welfare	Low	Medium	High
Economic Efficiency	Low	Low	High
Cost to the Government	High	High	Low

119. Both the modified buffer stock scheme and the import/export stabilization fund would decrease price fluctuations to producers and consumers. However, the buffer stock would do so at a higher level of prices than the stabilization fund, and is less efficient and more costly to the budget. Under the proposed buffer stock scheme, the official price band would be determined relative to domestic market prices, which would imply some lowering of the price band. This would improve financial management of the stabilization mechanism and benefit consumers, but it would not bring the price band into alignment with the long-run trend in world price. The buffer stock scheme will also discourage the development of private sector trade, limiting the scope for private sector price stabilization. It will keep the budgetary cost of stabilization high, because the Government would bear the physical costs of handling the commodity--a function it performs inefficiently relative to the private sector.

120. The second proposal is to adopt a trade-based system of stabilization coupled with a public sector import/export stabilization fund to buffer the domestic market from extreme fluctuations in world market prices. Such a system would provide maximum benefit to consumers by lowering the average price of rice, while improving economic efficiency and minimizing budgetary cost. It would lower the average price of rice by adopting a trade orientation in which the target price band were set on the basis of the long-term trend in import and export parity prices. It would improve economic efficiency by: (i) relying on the private sector for all marketing and trade; (ii) limiting direct Government purchases and sales to supplying the targeted distribution program; (iii) conducting all Government purchases and open market sales at market price, rather than official prices, to eliminate the two-tiered pricing structure; and (iv) adjusting target prices to trends in world market prices to ensure that domestic prices reflect reasonably well the long-run opportunity cost of rice. The budgetary cost would be small relative to a buffer stock scheme because it would avoid the physical costs of handling foodgrain, allow Government to hold interest-bearing reserves, and reduce Government subsidization through realignment of the price band. Finally, given the level of domestic prices, the stabilization fund would initially be oriented more toward the avoidance of price peaks which would threaten consumers with extreme nutritional deprivation--clearly Bangladesh's highest priority. Later, with expansion of an efficient rice sector and adherence to a flexible exchange rate regime, domestic market prices could approach export parity prices, and the stabilization fund would then provide a trade-based safety net for producers, as well. From a long-term perspective, adopting a stabilization mechanism which facilitates rather than impedes private sector trade will allow Bangladesh to use its comparative advantage to export rice.

## CHAPTER V

### Targeted Food Distribution

121. Untargeted interventions to reduce the price of rice in domestic markets have the most far-reaching consequences for the welfare of the poor in Bangladesh. For this reason, high priority should be given to liberalization of trade policy and flexibility of the exchange rate in order to reduce the level of protection in the domestic rice market. However, untargeted interventions can be supplemented with mechanisms for targeting specific groups with food and/or income transfers to enhance their food security. The Government of Bangladesh has sought to do this through the Public Food Distribution System (PFDS), which is supported by budgetary resources and food aid and financial assistance from the donor community. Currently, the PFDS operates through more than a dozen ration channels, with different degrees of subsidization (Table 6.1). Three untargeted channels operate in the domestic market: open market sales (OMS), marketing operations (MO) and free sales (FS). OMS is the dominant channel, selling foodgrain at a price which is supposed to be 15 percent higher than the official procurement price (20 percent higher in areas with statutory rationing), but which has been far less in recent years. Four targeted channels serve relatively well-off segments of society: (i) statutory rationing (SR) for government employees in certain districts of Bangladesh; (ii) other priorities (OP) for government and parastatal employees in non-SR areas; (iii) essential priorities (EP) for the military and security forces; and (iv) large employers (LE) for personnel in industries with 50 or more employees. In all but the EP channel, ration quotas have been reduced, and issue prices have been raised to the OMS level in the past few years in order to reduce the financial and economic subsidies to these better-off groups. The EP channel, however, remains heavily subsidized, with issue prices set 80 percent below the OMS price, and largely unlimited quotas. Finally, wheat is monetized through monthly sales to more than one hundred flour mills (FM) at the OMS price.

122. Distribution channels oriented toward the poor include a sales channel, a variety of self-targeting channels that try to link food distribution to recipients' participation in development activities, and several relief channels. Palli rationing (PR) sells foodgrains at 25 percent below the OMS price to the rural and urban poor, as identified through local tax rolls. The largest self-targeting program is the food-for-work (FFW) channel which provides mostly seasonal employment in construction and reconstruction of rural infrastructure (roads, bridges, irrigation, drainage channels, fish ponds). These programs are implemented by the Government, the World Food Program and the non-governmental organization CARE, with much of the funding and food aid supplied by bilateral donors. The vulnerable group development (VGD) program began as a supplemental feeding program for poor mothers and children, but has since tried to link food distribution to skills training and savings schemes. The much smaller rural maintenance program (RMP) also focuses on destitute women, providing them with full-time employment in road maintenance for a two-year period. The objective is for these women to "graduate" from the program with skills and sufficient savings to find or create their own employment opportunities. In addition to the self-targeting channels, the Government maintains several relief channels, test relief (TR) and gratuitous relief (GR), which provide free foodgrains to the needy in times of flood, famine, political unrest or other emergency situations.

TABLE 5.1: Coverage and Quotas in the Public Foodgrain Distribution System, FY90

Rationing channel	Code	Coverage	Total number of beneficiaries	Rations (per week, unless noted)	--RICE--			--WHEAT--		
					Issue price (ex-godown) (Tk/MT)	Quantity sold (000 MT)	Share of total distri (%)	Issue price (ex-godown) (Tk/MT)	Quantity sold (000 MT)	Share of total distrib (%)
Open market sales	OMS	untargetted price stabilization	all consumers		10,250	15,000	2.2	6,650	6,000	0.4
Marketing operations	MO	untargetted price stabilization	all consumers		10,250	0	0.0	6,650	0	0.0
Free sale/auction	FS	stock disposal at free market price	all consumers		market price	5,000	0.7	market price	0	0.0
Statutory rationing	SR	government employees in six districts: Dhaka, Narayanganj, Chittagong, Rangamati, Khulna, Rajshahi	3,600,000	1.0 Kg rice, 0.5 Kg wheat, per capita up to 6 family members 200 gm sugar, 200 gm salt per capita up to 5 family members	10,000	7,000	1.0	6,800	150,000	10.1
Other priorities	OP	government employees in non-SR areas	5,200,000	1.0 Kg rice, 0.5 Kg wheat, per capita up to 6 family members	10,000	62,000	9.2	6,500	218,000	14.6
Flour mills	FM	private, public and mixed flour mills	100 mills	approximately 30,000 MT/month	n.s.			6,800	304,000	20.4
Large employers	LE	employees in large industries	2,400,000	3.25 Kg rice, 5.0 Kg wheat per capita, for 1 wage earner	10,250	2,000	0.3	6,800	31,000	2.1
Essential priorities	EP	armed forces, police force, hospital patients	1,400,000	armed forces/policy: unlimited foodgrains, salt, sugar & oil hospital patients: 2.5 Kg rice, 0.5 Kg wheat	1,800	93,000	13.8	1,500	47,000	3.2
Palli (rural) rationing	PR	eight percent of the rural poor, as determined by tax payments	6,600,000	1.5 Kg rice up to 3 family members, 50 gm salt up to 5 family members 2/	7,500	386,000	57.2	5,000	45,000	3.0
Food for work	FFW	seasonal workers for rural road reconstruction	3,000,000	3.5 to 4.5 Kg wheat per day of labor (approx. 24 Kg/week)	0	28,000	4.1	0	431,000	28.9
Vulnerable group develop.	VGD	poor mothers and children	450,000	7.0 to 8.0 Kg wheat	0	6,000	0.9	0	92,000	6.2
Rural maintenance program	RMP	destitute women	81,000	cash payment, Tk 156/week equivalent to 23 Kg wheat/week				6,650	90,000	6.0
Test relief	TR	temporary relief for needy, often in exchange for manual labor	unknown	0.5 kg per capita per day (3.5 kg per week)	0	34,000	5.0	0	59,000	4.0
Gratuitous relief	GR	temporary relief for needy, often in exchange for labor	unknown	0.5 kg per capita per day (3.5 kg per week)	0	13,000	1.9	0	15,000	1.0
Other		cluster villages, canal digging, etc.	unknown	0.5 kg per capita per day (3.5 kg per week)	0	24,000	3.6	0	1,000	0.1
TOTAL			22,711,000			675,000	100.0		1,489,000	100.0
Stock build-up						437,000			(345,000)	

123. The Ministry of Food is responsible for the logistics of procuring, transporting and storing foodgrains for the entire PFDS, and directly manages the various sales channels. Management of the self-targeting and relief channels is the responsibility of the Ministry of Relief and Rehabilitation. Numerous evaluation reports have examined the different food distribution programs in Bangladesh, and no attempt will be made here to reproduce their detailed analyses. Rather, this chapter will highlight four issues of critical importance to making targeted programs more effective in achieving both short-term food security and longer-term development goals: (i) channeling more resources toward the food insecure; (ii) improving targeting mechanisms; (iii) selecting food-based development activities with high economic and social rates of return; and (iv) using food aid as a financial resource.

#### Channeling More Resources Toward the Food Insecure

124. Only 45 percent of Government foodgrain resources were distributed through channels targeted toward the poor in the FY85-90 period. Not only has a large portion been directed to relatively well-off groups, but it has been done at a high budgetary cost, with little or no economic benefit for the recipients. This was particularly true in FY90, as evidenced by the economic and financial subsidy rates for the different channels.<sup>1/</sup> For rice, financial subsidies were relatively high for all channels because of the high cost of rice acquisition. This was the result of the large volume of domestic procurement, as well as the inflated prices paid for commercial rice imports. Economic benefits for most sales channels were low--and those channels which sold at the OMS price (i.e., SR, OP, LE) taxed ration cardholders in economic terms because the official price exceeded border prices. Not surprisingly, sales in these channels were slow, accounting for only 11 percent of total rice offtake. In fact, for these channels and the OMS channel, the Government sustained a loss of Tk 63 million for programs which failed to provide any economic benefit to recipients. Likewise, in the PR channel, which is targeted toward the poor, the economic subsidy was only three percent while the financial subsidy was 30 percent. In other words, the channel served largely to counteract the effects of Government protection of the domestic rice market, while costing the budget nearly Tk 1.3 billion. Overall, the economic benefits of rice rationing for all channels combined equaled around Tk 1.3 billion in FY90, but the financial subsidy was Tk 3.3 billion. This is a direct result of the drift upward in the Government's official price structure relative to the long-run trend in world prices: it has reduced the economic benefits of rice rationing while raising its financial cost. It has also had the effect of slowing sales in most channels during years of

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<sup>1/</sup> The economic benefit of rationing for recipients is seen in the economic subsidy, which compares the ration price to the economic cost of the ration (i.e. the border price). The budgetary cost of rationing programs is captured in the financial subsidy, which compares the ration price to the financial cost of the ration (i.e., based on the average unit cost of acquiring and storing public stocks). A comparison of: (i) the economic subsidy; and (ii) the financial subsidy for a particular channel indicates: (i) the benefit gained by the recipient; and (ii) the budgetary cost of providing this benefit, respectively. "Food subsidies" calculated by comparing ration prices to the official OMS price say nothing about either economic or financial subsidies.

abundant harvests, leading to a build-up in public stocks which by end-FY90 had a financial cost of Tk 4.7 billion.

125. The only channels where rice rationing had a significant economic benefit in FY90 were the highly-subsidized EP channel and the self-targeting and relief channels, where rice was distributed free or in exchange for labor (with, presumably, a low opportunity cost of labor). Traditionally, the channels oriented toward the poor have been dominated by food aid wheat, although in early FY90, the Government opted to distribute only rice through the PR channel as a means of reducing excess stock. This practice has continued in later years serving as further rationale for large-scale domestic procurement of rice. All ration channels targeted towards the poor had economic subsidies on wheat in FY90, with rates ranging from 30 percent on palli rationing to 100 percent for the relief channels. The immediate economic benefit of these programs for the recipients is clear and undeniable. These poverty alleviating channels together accounted for 89 percent of the total economic benefits on wheat from the PFDS in FY90. Financial subsidies were less (and even negative for the PR channel) because the high proportion of food aid in wheat stocks brought the average cost of wheat acquisition down to well below the economic cost. For this reason, channels selling wheat at or near the OMS price generated Tk 1.9 billion in net revenues for the budget.

126. While selling foodgrain at full cost to higher-income consumers can be an efficient way to generate revenues to target toward the poor, any Government subsidization of these higher-income groups deprives the malnourished masses--and they are indeed masses--of desperately needed resources. Most of these higher-income channels currently provide little or no economic benefit to the recipients, but waste scarce budgetary resources which could support poverty alleviation or development activities. These channels (i.e. SR, OP, EP and LE) should be completely phased out, and the resources released should be channeled to the poor through self-targeting programs. Among the higher-income channels, the biggest financial drain on the budget is EP, but it is also the only channel to provide real economic benefits to its recipients, and it remains politically quite sensitive. In general, keeping economic benefits high and financial subsidies low in the rationing system will require adjustments to the Government's target price band to bring it into line with the trend in world prices. A continued reliance on food aid to generate revenues for the PFDS, leaving commercial importing to the private sector, will also keep financial costs under control.

#### Improving Targeting Mechanisms

127. Channels targeted toward the poor reach an estimated 10.1 million beneficiaries, who received an average of 8.9 Kg/month of foodgrains in FY90. According to the 1988/89 household expenditure survey, the poorest decile of the population (about 11.4 million people) consumed only 9.4 Kg/month per capita (including any PFDS foodgrain they received). Clearly, the potential impact of the existing distribution system on the welfare of the poorest consumers is enormous, if the system were effectively targeting those most in need. However, a review of the various programs reveals that, in many cases, those who are the most food insecure are not being reached, and those that are often do not receive their full entitlement.

Reaching the Food Insecure

128. Households in the lowest tax bracket, paying little or no taxes, are eligible for subsidized sales through the Palli rationing channel, but only eight percent (6.6 million) of the estimated 83 million eligible people are covered by the program. Reviews of palli rationing in its present form have found the channel to be fraught with abuse in both the selection of recipients and the pricing of rations. Since FY90, the channel has been the primary means for disposal of domestically procured rice, and, increasingly, has served as a justification for continued high levels of domestic procurement, regardless of market price. Evidence also suggests that unscrupulous local officials and ration dealers have earned tidy sums through fraudulent procurement and distribution transactions involving the PR channel. Under a liberalized trade regime, the PR channel could be eliminated with little loss of economic benefit for the recipients, and replaced with self-targeting programs which appear to be somewhat less prone to corruption. The constraint lies in the administrative capacity to expand self-targeting programs, which currently serve about 3.5 million beneficiaries.

129. The FFW program is by far the largest self-targeting channel, reaching approximately 3.0 million beneficiaries and distributing two-thirds of the foodgrain earmarked for self-targeting programs. In FY90, approximately 70 percent of FFW wheat was distributed through the Local Initiatives (LI) scheme, an upazilla-based scheme which provides wages in kind predominantly for construction of rural roads and associated structures (bridges, culverts). Since then, WFP has reprogrammed a portion of its FFW resources into other activities, including construction of larger connecting roads and flood control and irrigation canals, excavation of fish ponds and forestation. However, from a food security standpoint, the majority of FFW activities target the wrong people at the wrong time of the year. As documented in Chapter II, children and women of child-bearing age are at the highest nutritional risk year-round, but particularly in the August-October lean season. The FFW "season" generally runs from November to April, with more than half the distribution occurring in the three-month period from December to February. Less than ten percent of the FFW distribution occurs in the lean season, which is typically the season of lowest food availability, highest incidence of disease and slack demand for agricultural labor. This timing is a function of the focus on construction of various types of rural infrastructure, which can only occur in the post-monsoon season. In addition, the need for accountability in the use of food aid resources has been met through a system of wage payments on a piece-work basis (e.g., volume of earth moved, kilometers of road reconstructed). This incentive, which tends to emphasize quantity at the expense of quality, also favors physically stronger individuals--virtually shutting women out of many activities. Only about 10-15 percent of the FFW labor force is female. WFP monitors two activities which employ women almost exclusively: the Post-monsoon Rehabilitation program, which is currently being phased out, and the Forestry program which was launched in the past two years and is one of the only FFW components to provide year-round employment for women. However, these two programs are expected to account for only 3.5 percent of food resources distributed under FFW in FY92. Another 2.5 percent is allocated for excavation of fish ponds, with women making up approximately half the labor force. While it can be argued that foodgrain given to men under FFW will be distributed within their households, it is clear that

women and children stand a better chance of eating more if food or income is transferred directly to women. Some argue that the timing and targeting of FFW is an inevitable conflict between the short-term food security goals and the long-term development goals of the program. However, this rests on the assumption that there is nothing that women or children could do during the monsoon season that would carry a high social rate of return. While construction of rural infrastructure is an important development priority in Bangladesh, it is certainly not the only one. Greater diversification of FFW activities--including modified rural infrastructure components during the dry season--would lead to more effective targeting of the food insecure without sacrificing development objectives.

130. The VGD and RMP channels, which serve approximately 0.5 million women, do appear to target those at high nutritional risk on a year-round basis. Recent surveys of beneficiaries have indicated that they are overwhelmingly: (i) female heads of households (widowed, divorced or abandoned); (ii) landless (and often squatters on others' land); (iii) illiterate; and (iv) low income (Tk 68/month in the case of VGD). However, in reaching those at severe risk, the VGD program has not progressed far from its initial relief orientation (see paras. 141-142).

#### Reducing Leakage

131. All food-based programs in Bangladesh suffer from considerable "leakage" of resources; i.e., resources not being used for the purpose for which they were intended. Leakage occurs in a variety of ways. In programs which rely on Government monetization of food aid to provide cash wages, Government diversion and delays in the transfer of counterpart funds to these programs have resulted in considerable loss of interest income that could be used for wages or equipment purchases. In a number of programs, a portion of recipients' wages is supposed to be deposited in individual savings accounts, but these sums are sometimes held in trust by union officials, who may take liberties in the use of these funds. World Food Program (WFP), which oversees the VGD program, reported that leakage was as high as 35 percent in FY86, but claims that more rigorous accountability since then has brought the figure down to 15 percent. Observers question whether leakage has really declined to this extent, however. CARE studies have indicated that under their Integrated FFW program, an estimated 20-35 percent of food resources is misappropriated at the upazilla and union level. Although CARE does random post-surveys in upazillas to identify discrepancies in wage payments and work completed, these results are used to adjust the volume of foodgrain reimbursed to the central government, not the allocations to particular upazillas. Thus, the system offers little incentive for reduced leakage at the local level. Given the current structure of upazilla resources, it is not surprising that local officials use FFW as a source of discretionary spending. A survey carried out by USAID in FY90 found that food aid represented 77 percent of all resources in the upazillas sampled, and cash grants from donors for administration of food programs was another 12 percent. Clearly, developing incentives for good performance at the upazilla level, increasing the capacity for local resource mobilization, and linking local resource mobilization to increased financial assistance from donors will be needed to reduce the level of leakage in food-based programs.

Selecting Development Activities with High Economic and Social Rates of Return

132. In reviewing the development impact of food-based programs, it is important to bear in mind the noble--and elusive--goals of such programs. First, they seek to integrate poor beneficiaries into the development process itself. Second, they strive to empower groups who are marginalized by the society in which they live. Third, they ask an under-equipped local government to take responsibility for the welfare of its constituency. These are not easy tasks in Bangladesh, but they are worth pursuing over the long-term. Food aid is a financial resource that Bangladesh cannot afford to refuse. The response to current weaknesses in food-for-development efforts is not to eliminate the programs or eliminate food aid, but rather to channel the resources into activities which have a high economic and social payoff for the country.

133. In the past fifteen years, the Government and the donor community have sought to reduce recipients' dependency on food handouts by linking food distribution to activities that: (i) generate temporary employment; (ii) build permanent assets; (iii) enhance income-generating skills; or (iv) provide infrastructure needed for increased economic activity. Many of the traditional relief operations have been transformed into food-for-development operations. FFW programs have dominated the field, distributing 400,000 to 600,000 MT of foodgrain per annum. In recent years, more than two-thirds of this foodgrain was distributed through the upazilla-based Local Initiatives scheme for the construction of earthen roads and associated structures. Thousands of individual road schemes were undertaken, often in the absence of a well-defined, priority network for rural roads. The rural road network now stretches to some 126,600 kms. compared to 14,400 km for all other roads (Type A and B feeder roads, national highways, etc.). For this reason, it has been suggested that perhaps Bangladesh is "saturated" with rural roads, and that additional construction or reconstruction is unnecessary. However, several studies of this issue have reached the same conclusion: the country is by no means saturated with economically viable roads, but, rather, is overburdened with lengthy rural roads of little or no economic value. Donor-funded FFW programs have contributed to the proliferation of unnecessary roads. As concluded in one report:

The main reason that the accusation of saturation is made is that people can see and map large numbers of earthen roads in each upazilla, few of which carry much traffic. The problem is that although there has been considerable construction and reconstruction, few of the resulting roads are of much economic value.<sup>2/</sup>

There are multiple reasons why this is so, including (i) inadequate engineering standards; (ii) donor constraints on resource use; (iii) criteria for upazilla resource allocation; (iv) poor targeting of economically viable road alignments; (v) incomplete alignments; and (vi) insufficient maintenance of alignments.

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<sup>2/</sup> Bangladesh Road Saturation Study, Abt Associates, CARE-Bangladesh, August, 1990, p. 54.

134. Inadequate engineering standards: Building good roads in Bangladesh is a challenge due to the delta soils (rich in clay, silt and sand), periodic flooding, abundant surface water and lack of natural stone aggregates for road beds. As a result, Bangladesh relies heavily on packed-earth roads which tend to disintegrate due to water absorption. It is estimated that some type of bridging or drainage structure is needed at least every two kilometers, and--as summed up in a recent roads study--"soil compaction probably constitutes the greatest issue facing road engineers in this country".<sup>3/</sup> However, the labor-intensive compaction methods currently used by the FFW projects are inadequate, and the piece-work payment system provides incentive to work quickly, contributing to insufficient compaction. A restructuring of workers' and contracting firms' incentives is clearly needed, as well as greater cash inputs in order to provide complementary equipment needed for compaction.

135. Donor constraints on resource use: Constraints on the use of food aid have tended to: (i) favor lower-quality earthen roads over those of higher economic value; (ii) establish fixed construction standards regardless of local conditions; and (iii) provide insufficient cash resources to finance the training, technical assistance, contracting firms and equipment that could lead to better selection and construction of roads.

136. Criteria for upazilla resource allocation: Allocation of food aid is based heavily on the "distress level" of the upazilla, as an indicator of the need for short-term poverty alleviation. However, it has been shown that the greatest need for road reconstruction is in upazillas which are the most developed, most urbanized, most densely populated and closest to district headquarters.<sup>4/</sup> Upazillas with high "distress factors" are most prone to prolonged flooding and road washout, and have the least economic activity and the least potential for economically viable roads. Although it is desirable to focus resources on the poor in these areas, it is not economically rational to invest in the construction and maintenance of an extensive network of rural roads. This is particularly so if the same resources can be spent on other activities which have a higher social rate of return (for example, food-for-school attendance or vocational training for women).

137. Poor targeting of economically viable road alignments: Local officials have failed to target FFW resources on the most economically viable alignments in their upazillas. The Road Saturation Study found that only 42 percent of upazilla wheat allocations were targeted on "needed roads" (i.e. economically justifiable roads).<sup>5/</sup> This was partly due to misappropriation of resources, but also to the tendency of upazilla officials to spread FFW resources evenly among

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<sup>3/</sup> Bangladesh Rural and Feeder Road Sector Assessment, Associates in Rural Development, Inc., Decentralization: Finance and Management Project, November, 1989.

<sup>4/</sup> Bangladesh Road Saturation Study

<sup>5/</sup> The study's definition of "needed roads" is based on linkages of expected centers of economic and social activity. It overestimates the network of economically viable roads as determined by rate of return calculations.

various unions to garner political support and to alleviate poverty in the short-term, regardless of the economic viability of the roads in question. Donors have not required economic impact assessments of proposed roads, and there has been little incentive, in the form of increased food aid allocations, for upazillas to select economically viable roads. Perhaps most importantly, often the most viable and valuable alignments are inter-upazilla, linking, for example, a rural upazilla to a larger urban center.

138. Incomplete alignments: Spreading resources too thin also deprives the upazilla of the economic benefits of many selected alignments. The Structures Impact Study found that only 41 percent of FFW roads in the sample were passable by rickshaw or baby taxi at least part of the year. Low road accessibility for mechanized vehicles results from two problems: (i) an insufficient number of structures; and (ii) lack of road and structure maintenance. A study of CARE's rural roads and bridges program examined the economic benefits of fully bridged roads, partially bridged roads and unbridged roads.<sup>5/</sup> It was found that fully bridged roads had twice as much mechanized traffic as partially bridged roads, and that partially bridged and unbridged roads had about the same degree of accessibility for mechanized vehicles. Transport costs were 12 percent higher for partially bridged roads and 19 percent higher for unbridged roads than for the fully-bridged roads. Clearly, upazillas would do better to concentrate on construction and maintenance of a few fully-passable, bridged alignments with high economic benefit than to partially upgrade a larger number of roads.

139. Insufficient maintenance of alignments: Maintenance of roads and structures must be selective, focusing only on economically viable alignments, given the length of the network and the paucity of funds for maintenance activities. One estimate of maintenance requirements concluded that:

The implied resource requirement of a country-wide maintenance program is dominated by the tremendous length of the local rural road network. Even if only 25 percent of that portion of the network were deemed economically viable to maintain, the implied resource requirements would exceed those required to maintain the entire Type B feeder road system.<sup>2/</sup>

The delegation of responsibility for rural road maintenance to the upazilla level has not been matched with an increase in upazillas' capacity to mobilize local resources. Based on a small sample of upazillas, it was estimated that the cost of maintaining the average length of feeder and rural roads in an upazilla, assuming that only 25 percent of the rural roads were economically viable, would absorb nearly three-fourths of local resources. However, the donor community has failed to provide adequate incentives for rural road maintenance under FFW programs. They have not financed maintenance directly, nor required financially-sustainable maintenance plans as a condition for further reconstruction, nor rewarded upazillas for maintenance activities.

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<sup>5/</sup> Abt Associates, 1989.

<sup>2/</sup> Bangladesh Rural and Feeder..., op. cit., p. 17

140. While the economic benefits of FFW road reconstruction have been limited, there is also evidence that it has had negative impacts on neighboring landowners. The FFW programs have relied on "donated" land, for which owners are not compensated. Some evidence suggests that small landowners lose proportionally more land than larger landowners, but the real question is whether small landowners can afford to lose any of their scarce land, particularly to construct roads of little economic value. There are numerous examples of substandard alignments which turn sharp corners and take circuitous routes in order to avoid the land of local elites. In addition to increasing the length, and hence, the cost of road reconstruction, these meanderings create drainage problems and/or additional need for expensive structures. At the very least, FFW programs should have clear title to all land appropriated, and a legal framework for land compensation which is rigidly adhered to. The authors of the Bangladesh Rural and Feeder Road Sector Assessment put it best:

In a country where disputes over land ownership rage continually, and where it is common knowledge that fraudulent means are often used to secure formal title to land, the absence of attention to ownership rights involved in the construction and reconstruction of rural roads is striking and disturbing.<sup>8/</sup>

141. In response to some of the weaknesses in the Local Initiatives scheme, and, in particular, to overcome an inadequate ratio of cash to food resources in the LI program, WFP has begun to shift some of its resources into alternative FFW activities. The share of WFP-monitored foodgrains going into LI has been reduced from 48 percent in FY90 to an expected 32 percent in FY92. Most of the shift has been into a Growth Center and Connecting Roads (GCCR) Project which focuses on the construction and maintenance of roads which transcend the upazilla, linking it to urban centers. The GCCR project is an improvement over most LI road schemes because: (i) the roads tend to be those which have the greatest economic impact; (ii) the implementing agency, the Local Government Engineering Board, has greater technical expertise than the upazillas; and (iii) food resources are integrated into nationally-approved road projects to ensure the necessary complement of cash resources and technical assistance. WFP has also begun shifting resources into fisheries and forestry, areas that began as pilot projects several years ago. In both cases, FFW labor is integrated into fully-funded Government or NGO projects, to ensure adequate supervision and enhance sustainability of the projects. In the fisheries program, FFW labor is used almost exclusively to excavate ponds during the dry season, while the forestry program provides year-round employment, including the lean months of the monsoon season. Female participation stands at around 50 percent for fisheries and 95 percent for forestry programs, but these promising activities are still in the take-off stage, and receive only a small share -- an expected 4 percent in FY92-- of WFP's food resources. Indeed, looking at the entire FFW program (WFP, Care and Government-monitored schemes), one finds that the Local Initiatives program still accounts for half of all foodgrain distributed, while another 25 percent is distributed through BWDB infrastructure projects, including coastal and river embankments, irrigation and drainage canals and desiltation of rivers. With another 10 percent allocated to the GCCR Project, it is clear that more than 85

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<sup>8/</sup> Bangladesh Rural and Feeder..., op. cit., p. 28.

percent of FFW resources supports rural infrastructure development, which tends to have low levels of female participation, bunching of food distribution in the dry season and relatively high cash requirements.

142. In addition to the FFW programs, efforts have been made to give the VGD program a development orientation. While the results have been encouraging, progress has been slow, with only an estimated 20 percent or less of the 450,000 VGD beneficiaries involved in any kind of development activity. Progress is hampered by the program's locus in the Ministry of Relief and Rehabilitation, which doesn't facilitate integration of the program into development activities at either the national or local level. Another impediment to initiation of development activities is that beneficiaries tend to be geographically dispersed because local officials try to spread resources broadly throughout the union. A shortage of cash resources, and lengthy delays (often more than a year) in the transfer of food aid counterpart funds to project accounts also inhibits the operation of the VGD program.

143. In a recent monitoring report, WFP stated that 95 percent of the VGD centers visited had instituted savings schemes for beneficiaries, 39 percent offered some kind of income-generating activity, 19 percent provided health education, 16 percent taught basic literacy and numeracy, 9 percent promoted group formation and 9 percent sponsored community works, particularly tree-planting. Savings schemes have become widespread due to their relative ease of administration, but have, unfortunately, been subject to considerable fraud. The dominant income-generating activity offered through the VGD centers is poultry-raising under the Integrated Poultry Program (IPP). Other activities being implemented include formation of rural cottage industries, vocational training, health, nutrition and agricultural extension, functional literacy programs and institutional feeding. The latter program, however, has largely targeted boys in Muslim schools, while girls, who are at higher nutritional risk, have been shut out of the program. In the future, the VGD program will seek to redress this problem, placing special emphasis on school feeding for girls.

144. The RMP targets approximately 61,000 destitute women, who are organized into crews for routine maintenance of rural roads. The program suffers from the same weaknesses in construction and maintenance technique as the FFW programs. It has also been plagued with lengthy delays in the transfer of counterpart funds and poor financial accountability. A 1990 evaluation report by CIDA raised questions about the sustainability of the program, given the high degree of external funding and the beneficiaries' dependence on Government employment. A phased withdrawal of Canadian assistance was suggested to allow the Government to assume greater financial responsibility for the program. However, it is certain that Bangladesh will rely on external assistance for recurrent cost financing of development activities for many years to come. If the RMP program is an effective use of resources, then shifting Canadian assistance into some other activity is not justified. The real sustainability question is whether the two-year program provides women with the necessary skills and capital to sustain employment and income generation beyond the program period. Evidence suggests that this may not be the case, and it has been suggested that women be organized into permanent, private labor-contracting societies which could bid for road projects instead of relying directly on Government employment.

### Using Food Aid as a Financial Resource

145. This report argues that the attainment of self-sufficiency in rice need not be accompanied by a decline in non-rice food aid. Food aid is a financial resource like any other form of external assistance, and can be transferred to targeted groups either in cash or in kind. At present, most food aid is distributed directly to beneficiaries, although virtually every distribution program monetizes some food aid in the open market to cover the costs of inputs other than labor. It is sometimes argued that distribution in kind is better than cash because: (i) it has a bigger impact on food security among the most vulnerable groups, particularly women and children; (ii) it is self-targeting toward the poor; and, (iii) it is more difficult to misappropriate a bulky commodity than cash. The first argument rests on the assumption that consumption by women and children is likely to be higher if a household receives foodgrain rather than cash. Studies indicate, however, that giving women either food or cash will have a more positive impact on food consumption than giving either to an adult male member of the household. For this reason, the food-for-work programs in Bangladesh fall short of their food security potential. The second argument, rests on the assumption that food is "worth less" than cash, or carries a social stigma, so that only the truly needy accept food as wages. Generally this perception results from an overestimation of the value of the food which doesn't take into account the transaction costs of converting foodgrain to cash. If cash wages are set sufficiently below the prevailing agricultural wage, then they, too, will become self-targeting. The third argument--that it is easier to pilfer money than foodgrains--is difficult to refute or defend, given the high degree of leakage in both cash and kind from the targeted programs. With respect to Government accountability for cash relative to foodgrains, experience with monetization of food aid has been frustrating for implementing agencies, due to the lack of accountability for earmarked counterpart funds. It should be noted, however, that donors have invested heavily in systems and staff to ensure accountability for physical inventories of food aid. No such investment has been made in accountability for counterpart funds, and no donor has been willing to halt disbursements for failure to comply with procedures for monetization and transfer of counterpart funds.

146. The advantages of cash transfers to vulnerable groups are that: (i) the complete fungibility of the resource allows beneficiaries to maximize their utility, i.e., buy whatever is of most value to them; and (ii) cash transfers are vastly more efficient and cost-effective than hauling and storing foodgrain stocks throughout the country. That the beneficiaries of targeted food programs already choose to maximize their utility by converting their rations into cash is quite evident: CARE estimates that 50 percent of FFW wheat is monetized in local markets, and flour millers confirm that they often turn to the open market to purchase food aid wheat. VGD beneficiaries also sell off a large portion of their wheat immediately, often to avoid carrying the bulky commodity back to their village. The arguments for providing food rather than cash are less persuasive in light of beneficiaries' behavior. The efficiencies to be gained in transferring cash rather than foodgrains are obvious: no bulk transport, no storage, no spoilage, etc. While the following chapter will assess the scope for reducing inefficiencies in existing Government food operations, it must be recognized that the biggest cost saving would result from an increased reliance on monetization of food aid, selling it to wholesalers directly out of port silos

and using the revenues generated to support poverty alleviation and development initiatives. Donors would need to be more flexible regarding monetization of food aid. However, increased reliance on cash transfers for targeted programs depends critically on the introduction of a reliable and transparent mechanism for monetization of food aid and deposit of counterpart funds in project accounts. Continued provision of food aid must be made contingent on Government's performance in this area.

147. While Government should make maximum use of food aid resources for targeted programs, if budgetary revenues are used, then transfer of these revenues as cash would clearly be the most efficient form of assistance. To the extent that Government feels compelled to purchase foodgrains for distribution, the source of procurement should be dictated by market prices: if domestic price is lower than world price, Government should procure locally. Alternatively, if domestic price exceeds world price, Government should import to avoid placing additional upward pressure on domestic prices. Of course, with the private sector taking over commercial importing, and with increased reliance on cash transfers in targeted programs, the rationale for any Government procurement of foodgrains would be extremely limited.

#### The Policy Agenda for Targeted Programs

148. Maximizing the impact of targeted distribution programs will depend on progress in four areas: i) shifting more resources towards the food insecure; ii) selecting development activities with high rates of economic and social return; iii) "mainstreaming" food resources into the development process at the national and local level; and iv) establishing greater financial accountability with respect to food aid monetization, transfer of counterpart funds, and leakage of cash and kind resources. The Government/Donor Joint Task Force on Strengthening the Institutions for Food Assisted Development (SIFAD) has focused heavily on institutional reforms needed to mainstream food resources and enhance their development impact. The major recommendations emerging from the SIFAD report include:

- a. giving responsibility for strategic planning of food resources to the Planning Commission, in order to integrate it into the planning process for the ADP;
- b. developing a new upazilla block grant that would include a general cash grant, a cash/food rural infrastructure grant, and a cash/food poverty alleviation grant;
- c. transferring the administration of food-assisted programs to the Ministry of Local Government, Rural Development and Cooperatives (MLG), rather than the Ministry of Relief and Rehabilitation (MRR);
- d. rationalizing staff deployment at the upazilla level, and strengthening the upazilla engineering office and the upazilla rural development office;

- e. expanding the role of the Bangladesh Rural Development Board (BRDB) in providing technical assistance and advisory services to upazillas for poverty alleviation activities;
- f. expanding the role of the Local Government Engineering Board (LGEB) in providing technical assistance and advisory services to upazillas for rural infrastructure development;
- g. strengthening the monitoring capacity of the Implementation, Monitoring and Evaluation Division (IMED) in the Ministry of Planning, and the Directorate General of Monitoring, Evaluation and Inspection (DGMEI) in the Ministry of Local Government.

149. On the whole, the SIFAD recommendations are pragmatic and constructive. They address the need to integrate food resources into the development process at the national level, support the decentralization of implementation responsibility to the upazilla level, and restructure financial resources available to the upazilla. The Task Force worked within the boundaries of the present configuration of food-based activities, distinguishing only between rural infrastructure activities and "other" poverty alleviation activities. In this respect, SIFAD could perhaps have gone further to recommend a medium-term restructuring of food-based programs which would successfully diversify development activities in order to reach the most vulnerable groups-- women and children in particular--at times of high nutritional risk. Indeed, the key recommendation of this Food Policy Review with respect to targeted programs is to adopt a menu approach, establishing perhaps half a dozen high-impact food-for-development options that can be implemented at the local level and adapted to local conditions. Confronted with the weaknesses of the existing LI program, donors have begun to diversify FFW activities into other sectors. These initiatives should be pursued and accelerated. Creating five or six strong sectoral FFW programs will take time, but a balanced menu of options must replace the current, lopsided emphasis on construction of rural infrastructure, which has failed to target those most in need and has fallen short of its development potential.

150. Conceptualizing the various options for food-for-work activities would require input from technical ministries, upazilla officials, current beneficiaries, implementing agencies and food aid donors. However, one can easily imagine a menu that would build on existing initiatives, and include: (i) a modified, scaled-back rural infrastructure program; (ii) a small-scale industries program, incorporating current cottage industry and handicraft initiatives; (iii) an agricultural production and processing program, incorporating activities such as home-gardening, tree-planting, paddy husking and fruit/vegetable marketing; (iv) a livestock development program, incorporating poultry, goat-raising and fisheries initiatives; (v) an educational program, incorporating food-for-school and adult literacy initiatives; and (vi) a safe motherhood program, linked to prenatal/infant care and education in health, nutrition and family planning. If one begins from the premise that these programs should be an integral part of sectoral development strategies, then technical ministries on the national level have a major responsibility for

defining a program concept that has a high developmental impact and can be implemented at the local level under the direct supervision of the Ministry of Local Government.

151. In terms of channeling more resources toward the poor and improving the targeting of distribution programs, the recommendations of this report include:

- a. discontinuing, to the greatest extent possible, channels targeted to relatively well-off groups;
- b. minimizing economic and financial subsidies on remaining distribution channels targeted to relatively well-off groups;
- c. discontinuing all distribution of sugar, salt and oil;
- d. diversifying food-for-development activities to reach more women and children, particularly in the monsoon season;
- e. phasing out palli rationing in favor of self-targeting programs with a development impact;
- f. rewarding upazillas for reduced leakage with increased resource allocations;
- g. revising, as planned, the "distress factors" used to make resource allocation decisions, to include indicators of nutritional status, morbidity, mortality, income, and employment.

152. In terms of enhancing the development impact of targeted programs, the objective is to allocate resources for activities with high economic and social rates of return, and ensure their proper implementation. General recommendations include:

- a. adopting the menu approach to food-for-work described above, to ensure that there are economically viable alternatives for every upazilla;
- b. mainstreaming food resources into the planning process for the Annual Development Program, involving technical ministries, under the general coordination of the Planning Commission, in the design of alternative food-for-work and VGD programs;
- c. transferring implementation responsibility for food-for-work programs to the Ministry of Local Government;
- d. exploring the possibility of using food resources at the national level, for high-priority development activities that surpass upazilla boundaries;
- e. reviewing donor portfolios to determine whether food resources can be integrated into other aid-financed projects;

- f. increasing reliance on monetization of food aid to: (i) provide the necessary resources for cash inputs into food-for-work programs, and (ii) allow more efficient cash transfers to beneficiaries;
- g. developing a timely and transparent mechanism for monetization of food aid, transfer of counterpart funds and financial accounting of food resources;
- h. establishing incentives at the upazilla level for selection of high-return activities;
- i. augmenting capacity for local resource mobilization at the upazilla and union level through a variety of fiscal measures (reform of market leasing, imposition of a land value tax, vehicle licensing, etc.);
- j. linking central government grants and donor financing to progress in local resource mobilization;

153. Within a menu approach to food-for-work, a scaled-back program for rural road reconstruction and maintenance could remain an option. However, much reform is needed for the rural roads option to live up to its development potential. Policy recommendations include:

- a. selecting roads for reconstruction and maintenance on the basis of economic criteria, and requiring upazilla officials to prepare a standard economic impact assessment for all proposals;
- b. strengthening training and technical assistance in economic appraisal of infrastructure projects at the upazilla level;
- c. introducing alternative food-for-work activities in areas where roads are not economically viable;
- d. offering incentives/sanctions, including increased/decreased resource allocation, to upazillas for selection of economically viable roads;
- e. undertaking research on labor-intensive methods for adequate road compaction, and higher-durability road surfaces;
- f. increasing monetization of food aid to provide cash resources for the training, technical assistance, local engineering services and purchase of equipment needed to improve construction standards;
- g. revising the piece-work payment system for workers in order to provide incentives for appropriate soil treatment and compaction;
- h. shortening the rural road network through selective maintenance of economically viable roads and benign neglect of roads with little economic value;

- i. giving priority to maintenance of completed, economically-viable alignments over reconstruction of other alignments;
- j. directing donor resources toward maintenance activities rather than reconstruction;
- k. requiring financially-sustainable road maintenance plans as a precondition for allocation of food resources at the upazilla level;
- l. making upazilla resources from external, central government and local sources commensurate with upazilla responsibilities for road maintenance;
- m. requiring completion of economically-viable alignments before beginning to upgrade other alignments;
- n. revising the bidding process for engineering contracts to include prequalification of firms, open price competition, enforcement of time limits, and independent evaluation of outputs;
- o. reviewing standards for construction of roads, bridges and culverts to ensure cost-effective use of resources and minimum appropriation of land;
- p. rigidly enforcing a legal framework for ensuring right-of-way and compensation of owners for land appropriation;

154. Both the VGD Program and the RMP need to focus on skill-building and capital accumulation that will serve as a base for self-sustaining employment and income-generation when beneficiaries leave the program. The current Institutional Feeding Project should also be recast as a more general food-for-school program on the basis of childrens' primary school attendance, and could even select girls preferentially in order to help redress the gender gap in school attendance.

## CHAPTER VI

### The Efficiency of Government Food Operations

154. Growing concern over the dwindling local currency contribution to Bangladesh's Annual Development Program (ADP) has focused attention on the need to increase budgetary savings through improved management of current expenditures. Although there is an expectation that the Government's food operations should be a source of budgetary savings to finance the ADP (as evidenced by the earmarking of counterpart funds for development activities), or that these operations should at least be self-financing over the medium-term, they have proven to be a drain on the general Revenue Budget for most of the past decade. The deficit on food operations averaged Tk 2.8 billion per annum in the FY80-90 period, with the average for the second half of the decade nearly Tk 4.0 billion per annum. The situation deteriorated rapidly in FY90, with a deficit on the food budget of more than Tk. 11 billion, equivalent to about 15 percent of Government revenues and 60 percent of the taka component of the ADP that year.<sup>1/</sup> Under these circumstances, when funds are transferred from the food account to the ADP, it simply increases the deficit on the food account which must be covered by the Revenue Budget. The rapid escalation in the cost of food operations in FY90 forced Government to take stringent cost-cutting measures in FY91, as the Gulf Crisis further constrained the budget. While these measures reduced the deficit to around Tk 3.5 billion in FY91, they did not address structural imbalances in the food budget which have made it a permanent drain on fiscal revenues. This requires a more fundamental review of policy mechanisms, and of the efficiency with which Government implements food policies. Chapters III to V of this report have addressed the Government's choice of policy mechanisms; this chapter will focus instead on the efficiency of policy implementation.

#### Financial Accounting for Food Operations

155. The magnitude of the deficit on the food account is not immediately evident due to: (i) a tendency to monitor physical stock levels, with insufficient attention paid to financial flows; (ii) a tendency to focus on various calculations of "budgetary subsidies" which don't reflect the aggregate cashflow situation; and (iii) irregularities in the presentation of the food budget and its lack of integration with the general budget. These problems stem from long-standing weaknesses in the system and procedures for financial and inventory accounting. These weaknesses have been the subject of extensive analysis as part of the Government/FAO Reorganization Project for the Directorate General of Food (DGF) within the Food Ministry. The Project has highlighted the lack of resources devoted to planning, monitoring and control of food operations, the symptoms of which are evident in untimely importing, inefficient shuttling of grain to alleviate storage constraints, and a general sense of ad hoc decision-

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<sup>1/</sup> This deficit figure is based on Revised Budget figures. Although this figure is somewhat higher than the actual budget implementation figure for FY90, it is used here in order to compare with past years, for which actual budget implementation figures are unavailable.

making. Recording procedures for inventory and financial transactions are fragmented, non-standardized and often unenforced. Reconciliation of inventory and financial accounts is centralized in Dhaka, but the volume of unconsolidated data at this level is unmanageable and usually incomplete. As a result, no final reconciliation of accounts has been produced for the past eight years.

156. Nothing short of a completely revised financial management system could address the current inadequacies in financial accounting. In principle, the Government agreed in 1987 to implement the recommendations of the Reorganization Project, although those with vested interests in poor accountability appear to have slowed progress in this area. The recommendations seek to: (i) separate inventory and financial accounting; (ii) strengthen the internal audit function; (iii) decentralize budgeting, monitoring and recording of transactions to local "responsibility centres"; (iv) decentralize authority to incur expenditures up to an approved budgeted amount; (v) establish a strengthened Finance and Accounts Unit at each responsibility center; (vi) introduce standard double-entry bookkeeping at all levels; and (vii) establish a register of fixed assets and make provisions for depreciation. Introduction of a workable financial accounting system for food operations should be of highest priority for Government and the donor community. Interestingly, the donor community has typically shown less concern for this aspect than for physical accountability of food stocks. This, despite widespread dissatisfaction with Government's ability to monetize food aid and transfer counterpart funds in a reliable manner, as well as a more general frustration with the lack of taka resources for ADP financing. If one is looking for a way to free up taka resources for productive investment, one would be well advised to take a closer look at the cost of food operations.

#### Recent Evolution of the Food Budget

157. From a public finance perspective, it is important to accurately assess the aggregate cash deficit/surplus on the food account, which is simply the difference between cash revenues and cash expenditures. Unfortunately, this is rendered more difficult by the presentation of the food budget itself, and by the tendency to focus on calculations of "budgetary subsidies" that do not capture the full cashflow situation. Table 7.1 shows the food budget arranged along the lines of a standard public finance format. The World Bank and the International Monetary Fund have adopted this format in order to easily identify the annual budgetary impact of food operations, and integrate it into consolidated public accounts. Under this format, the operating balance is financed in two ways: (i) by external sources, i.e. food aid; and (ii) by domestic sources, i.e. the Revenue Budget. The latter is termed "net cash disbursements", and represents the aggregate cash deficit on the food account.

158. The cash deficit on the food account has fluctuated considerably from year to year, but the trend in recent years has been toward a widening gap. Cash revenues increased by only about five percent per annum in the FY80-90 period, while cash expenditures increased by nearly ten percent per annum. Cash acquisition, i.e. commercial imports and domestic procurement, as a share of total acquisition has also fluctuated through the years, reaching a record 62 percent in FY90. Although this share does influence the size of the cash deficit or surplus on the food account, the relationship is not straightforward.

Table 6.1 : The Food Budget, Modified Format, FY90 and FY91

	FY90						FY91						FY92	
	Budget		Revised Budget		Actual		Budget		Revised Budget		Actual		Budget	
	(000 MT)	(TK mil.)	(000 MT)	(TK mil.)	(000 MT)	(TK mil.)	(000 MT)	(TK mil.)	(000 MT)	(TK mil.)	(000 MT)	(TK mil.)	(000 MT)	(TK mil.)
<b>REVENUES</b>	2,300	10,208	2,420	9,991	2,165	9,520	2,400	12,678	2,400	12,269	2,366	12,185	2,500	14,430
Monetized channels	1,500	10,208	1,450	9,991	1,372	9,520	1,600	12,678	1,550	12,269	1,573	12,185	1,650	14,430
Rice	470	3,324	550	3,491	570	3,677	600	4,377	730	5,631	777	5,743	730	6,560
Wheat	1,030	5,234	900	4,558	802	4,558	1,000	6,359	820	5,136	796	4,940	920	5,780
Other		1,650		1,942		1,285		1,942		1,502		1,502		2,080
Non-monetized channels	800	0	970	0	793	0	800	0	850	0	793	0	850	
Rice			105		105		194				194			
Wheat			865		688		606				599			
<b>EXPENDITURES</b>		22,271		27,760		24,731		29,614		27,148		24,623		28,030
Procurement	2,430	18,634	2,729	22,311	2,495	20,334	2,930	25,108	2,875	21,616	2,361	19,634	2,700	22,180
Food Aid	1,600	10,437	1,211	7,093	948	5,504	1,780	13,314	1,725	9,856	1,541	10,492	1,750	10,060
Rice	75	829		412	41	410	0	0	0	0	11	79		
Wheat	1,525	9,514		6,587	907	5,094	1,780	13,314	1,725	9,796	1,530	10,413	1,750	10,060
Other		94		94					2	60				
Commercial imports	320	2,518	663	5,920	587	4,728	250	2,076	250	2,317	37	248	170	1,450
Rice			260	2,971	260	2,977	0	0	0	0	0	0		
Wheat	320	2,144	403	2,625	327	1,453	250	1,750	250	1,939	37	248	150	910
Other		374		324	13	298		326		14	378		20	540
Domestic procurement	510	5,699	855	9,298	960	10,102	900	9,718	900	9,443	783	8,894	780	10,660
Rice	430	3,726	785	7,045	918	8,331	800	7,257	800	7,260	727	6,940	700	7,920
Wheat	80	450	70	413	42	350	100	589	100	589	56	360	80	580
Oil				66				99	6	221		221	5	180
Sugar		1,402		1,652	53	1,327		1,652	45	1,252		1,252	68	1,810
Salt		121		121		94		121	40	121		121	50	150
Deferred payments				(663)		(663)				(956)		0		(7,800)
Freight		1,007		791		550		1,229		1,465		1,249		1,330
Operating Costs		2,610		4,658		3,847		3,277		4,067		3,740		4,510
<b>OPERATING BALANCE (commitment basis)</b>		(12,063)		(17,769)		(15,211)		(16,936)		(14,879)		(12,438)		(13,600)
Change in arrears		(850)		(753)		1,513		(925)		-1513		(1,513)		
<b>OPERATING BALANCE (cash basis)</b>		(12,913)		(18,522)		(13,698)		(17,861)		(16,392)		(13,951)		(13,600)
Financing		12,913		18,522		13,698		17,861		16,392		13,951		13,600
External sources:														
Valuation of food aid		10,437		7,093		5,504		13,314		9,856		10,492		10,060
Monetized channels		5,187		1,843		254		7,314		3,856		4,492		2,890
Non-monetized channels		5,250		5,250		5,250		6,000		6,000		6,000		7,160
<b>FOOD ACCOUNT BALANCE</b>		7,663		13,272		8,448		11,861		10,392		7,951		6,440
<b>NET CASH DISBURSEMENTS</b>		2,476		11,429		8,194		4,547		6,536		3,459		3,540
Memorandum items:														
Foreign aid deposit account ( earmarked to ADP)		4,280		4,000				4,050				4,300		4,300
<b>Change in stocks</b>		130		309		330		530		475		(5)		200

It depends also on the Government's price structure for procurement and ration sales relative to prices in the domestic and world markets. As the Government's price structure has diverged from the trend in world and domestic market prices, procurement has become more expensive while revenue growth has slowed. This was particularly evident in the FY87-90 period, when cash expenditures doubled while revenues increased by only 12 percent over the four-year period. Consequently, the cash deficit on the food account increased from Tk 1.5 billion in FY87 to Tk 11.4 billion in FY90, with the cost of domestic procurement in particular rising dramatically from Tk 2.3 billion in FY87 to Tk 10.1 billion in FY90.

#### Performance in FY90 and FY91

159. The initial budget for FY90 anticipated a cash deficit of only Tk 2.5 billion--a fraction of the final amount. The revised budget estimate was an alarming Tk 11.4 billion. The actual figure reported by Government was less, at Tk 8.2 billion, but much of the improvement over the revised budget figure can be attributed to unorthodox accounting procedures which shifted a significant portion of FY90 expenditures into the following fiscal year. This practice is most prevalent with respect to domestic procurement: the expenditures for the last two to three months of procurement in any fiscal year are recorded in the following year. In principle, the Government has agreed to discontinue this procedure, although the introduction of double-entry bookkeeping will be the most effective deterrent.

160. Revenues from ration sales fell only slightly short of expectations in FY90. Rather, the deficit widened as a result of escalating cash expenditures, which were 62 percent higher than budgeted (75 percent higher if corrected for accounting anomalies). Three factors fueled the rise in spending: (i) unnecessary commercial importing; (ii) massive domestic procurement; and (iii) increases in operating costs. Despite abundant harvests, the Food Ministry commercially imported 260,000 MT of rice which had not been budgeted along with 327,000 MT of wheat. Most of the rice was purchased at a CIF price of nearly US\$ 340/MT, at a time when high-quality, five percent broken Thai rice could be purchased for about US\$ 300/MT (CIF), and 25-35 percent broken (similar in quality to Bangladesh's own rice) for as low as US\$ 200/MT (CIF). The country was obliged to commercially import 200,000 MT of wheat to fulfill the Usual Marketing Requirements (UMRs) imposed by the donor community for receipt of food aid wheat. As a result of inflated prices and unnecessary quantities, the total cost of commercial imports reached Tk 4.7 billion, instead of the Tk 2.5 which had been budgeted. In an attempt to support a floor price, the Government also procured 918,000 MT of domestic rice, more than twice the budgeted amount. The procurement price of Tk 9075/MT was high relative to world prices and domestic prices in the post-harvest period, making Government purchase attractive to traders. Consequently, the cost of procurement exceeded the Tk 5.9 billion which had been budgeted, reaching more than Tk 10.0 billion.

161. Revised budget figures for operating costs (including establishment costs and Government flour mill operations) were 78 percent higher than initially budgeted and 34 percent higher than in FY89. Unit operating costs (based on tonnage handled) increased by 23 percent in FY89 and 19 percent in FY90, well above the estimated rates of inflation. Most of the increase in FY90 was due to rising variable costs associated with the increased share of domestic procurement

in total tonnage handled. In particular, there was: (i) a near tripling of the unit cost of interest payments to commercial banks for financing of domestic procurement; (ii) a near doubling in the unit cost of handling associated with the repeated movement of grain to release storage space and the movement of paddy/rice to and from mills; (iii) an increased use of gunny bags (which hold less paddy and rice by weight than imported wheat); and (iv) a 27 percent increase in miscellaneous charges, largely attributable to increased milling charges for paddy. Potential savings on internal transport were also not fully realized due to excessive shuttling of stocks within procurement areas. Internal transport is the single largest component (37 percent) of variable costs. Generally, internal transport costs rise as the proportion of imports (aided or commercial) in total acquisition rises, because locally-procured grains are normally carried over a shorter distance from source to distribution point than are imports. Unit transport costs, therefore, declined in FY90, when domestic procurement rose to 39 percent of total acquisitions. However, they were still rather high, being higher than in FY88 when domestic procurement was only 11 percent of total acquisition. It appears that the transport costs associated with domestic procurement in FY90 were close to those for imported grains. This corresponds to widespread reports of excessive shuttling of stocks in procurement areas in order to release storage space. It could also reflect donor restrictions on the use of food aid in distribution programs, leading to a south-north movement of food aid toward procurement areas and a simultaneous north-south movement of domestically-procured stocks toward consumption centers. Finally, a reduction in tonnage handled coupled with an increase in staff allowances led to a 21 percent increase in unit fixed costs in FY90, as well. However, it should be noted that although one can attribute most of the increase in unit operating costs in FY90 to the rising share of domestic procurement, there are also inefficiencies that keep operating costs higher than they need to be in every year. These inefficiencies will be discussed below.

162. Food operations in FY90 were the most expensive in Bangladesh's history. This unprecedented drain on the Revenue Budget was clearly unsustainable, and made reduction of the deficit on the food account a high priority for the Government in FY91. The budget called for a halving of the cash deficit, reducing it to Tk 4.5 billion by: (i) increasing revenue generation by 33 percent; (ii) limiting commercial imports to the minimum volume proscribed under the Usual Marketing Requirements; and (iii) reducing operating expenditures by 15 percent. The reduction in operating costs appeared least likely to materialize, given that domestic procurement on a scale similar to FY90 was proposed (despite the financial and storage constraints imposed by the previous year's build-up of rice stocks). The donor community supported two additional budgetary measures which were adopted during the fiscal year: (i) a commodity swap agreement was concluded which allowed 200,000 MT of local rice to be distributed under the VGD program while the corresponding food aid wheat was monetized; and (ii) a waiver of the Usual Marketing Requirements for FY91 as a form of exceptional balance of payments support during the Gulf Crisis. Indeed, exogenous events--both local and international--overtook Bangladesh in FY91, with important consequences for the food budget.

163. The Gulf Crisis and the dissolution of the Ershad Government following a period of civil unrest created a climate of uncertainty in Bangladesh for much of FY91. Reflecting this, rice prices in the domestic market were around 15

percent higher than in FY90, despite a favorable production situation. The rise in domestic rice prices temporarily reduced the divergence between market prices and the Government's price band for procurement and ration sales. As a result, domestic procurement declined (by nearly 200,000 MT) relative to FY90, and ration sales were brisk in all channels. The total cost of procurement declined by 12 percent relative to FY90 and sales revenues increased by 28 percent. The Government acquiesced to donor requests to refrain from commercial importing, and this--more than any other single measure--reduced the deficit on food operations. Foregoing commercial imports represented a budgetary savings of more than Tk 4 billion relative to FY90. Consequently, the cash deficit (including payment of FY90 arrears) was even less than budgeted levels: Tk 3.5 billion. The new Government showed commendable restraint in refraining from commercial importing of foodgrains following the cyclone in April 1991, relying instead on new and existing food aid commitments to supply the relief effort. As a result, the deficit on the food account was substantially reduced in FY91, and is expected to reach a similar level in FY92. Nevertheless, few steps have been taken to eliminate these structural deficits over the medium-term.

#### Efficiency of Policy Implementation

164. Events which were politically, economically and socially unsettling for the country as a whole had both positive and negative impacts on the food budget in FY91. However, dealing with these short-term priorities doesn't obviate the need to address the long-term structural imbalance in the food account that has made it a permanent drain on budgetary revenues. Food operations have the potential to be financially self-sustaining without jeopardizing the food security of the poor. Financial sustainability will depend most on the choice of policy mechanisms. The policy recommendations in Chapters III to V will make food policy in Bangladesh a more effective means of reaching the food insecure, but they also offer substantial cost savings for the budget. The biggest financial impact will be felt by:

- a. moving from a high-cost buffer stock arrangement for rice price stabilization to a reliance on private sector trade and a Government import/export stabilization fund;
- b. bringing the Government's target price band for rice into line with the long-term trend in world market prices, and setting a sufficient margin between floor and ceiling to seasonal storage by the private sector;
- c. relying on the private sector for commercial foodgrain imports and maximizing Government use of food aid resources;
- d. eliminating ration channels targeted to relatively well-off groups, or, where this is not possible, minimizing the economic and financial subsidies on these channels;
- e. increasing the efficiency of targeted programs by relying on monetization of food aid and cash income transfers to beneficiaries;

165. In addition to adjustment of policy mechanisms, Government can reduce costs by improving the efficiency of food policy implementation. A review of Government functions--importing, shipping and handling, transport, storage, procurement and distribution--will help to identify inefficiencies in current operations that can be eliminated regardless of whether they are accompanied by more fundamental policy reform.

#### Importing

166. There is a general sense that the Government has paid too much for commercial foodgrain imports in recent years, and has imported excessively at inopportune moments relative to the production cycle and expected food aid arrivals. It is strongly recommended that Government rely on the private sector for commercial importing in the future, to make imports more responsive to market signals. If Government nonetheless persists in commercial importing, the process should be as competitive and transparent as possible. In FY88 and FY89, only 7-8 percent of commercial importing by Government was subject to international competitive bidding (ICB). A larger share--31 percent in FY88 and 72 percent in FY89--has been subject to competitive bidding among U.S. suppliers only, due to special financing arrangements with the U.S. Commodity Credit Corporation. The remainder, and all FY90 imports, were on the basis of negotiated government-to-government deals (including barter arrangements) or, in a few instances, spot purchases.

167. Under ICB, the competition usually includes several major U.S. suppliers who, according to the Ministry of Food (MOF), generally win the bid. It has been suggested that the relative lack of participation by non-U.S. suppliers is due to unrealistic specification of maximum moisture content, which is usually set at 13.5 percent. This low level is difficult for non-U.S. suppliers to achieve, but is considered irrelevant by many experts who claim that the moisture content of any wheat will rise to the same equilibrium level upon arrival in Bangladesh. Most of the competition for wheat imports in recent years has been restricted to U.S. suppliers anyway, because of two special U.S. financing arrangements: (i) the Export Enhancement Program (EEP), and (ii) the GSM-102/103. U.S. wheat is generally priced at US\$ 10-20 above similar quality European wheat, but the EEP program subsidizes the U.S. price to cover the difference. The GSM programs are not subsidized, and extend credit on commercial terms. To the extent that the GSM is used, the Government of Bangladesh has paid a higher price than could be obtained in the international market for similar quality wheat. Clearly, buying on credit--whether from the U.S. or other sources--also raises the cost of imports above market prices.

168. Many of the negotiated deals and barter arrangements include deferred payment, and this element of credit may partially explain why they tend to cost more than internationally or U.S. tendered purchases. Although it is difficult to make price comparisons with little information on quality and other specifications, a review of import data from FY88-90 indicates that bartered and negotiated deals were substantially more expensive than international or U.S. tenders. Indeed, a Czech barter deal for rice in FY90 cost US\$ 59 MT more than the spot purchase of 200,000 MT of Thai rice--a purchase that was roundly criticized for its inflated price. In fact, the Thai purchase, coming at a time of record harvests in Bangladesh, is often held up as an example of everything

that is wrong with Government importing. Not only does it raise the question of whether Government is paying too much for the rice it buys, but also whether Government is buying rice which costs too much. Much of the rice imported has been Thai 15 percent broken, a better quality than most rice produced in Bangladesh. While no one denies that Bangladeshis with purchasing power should have access to higher quality rice, it is not the role of the Government to provide for their needs. Rather, scarce budgetary resources could be better spent on larger quantities of lower-quality, but equally-nutritious, rice to be targeted toward the food insecure.

169. Some public sector buying agents, such as the State Trading Corporation in India, operate almost exclusively on the basis of spot purchases, and receive an almost daily flow of pricing information from world markets. The MoF in Bangladesh lacks such market information, as was evident in the ill-fated Thai rice deal in FY90. Thus, although spot purchases may offer the best deals to savvy customers, they can also lead to very bad deals, and are less transparent and, therefore, more prone to corruption. Rather than moving toward spot purchases, it might be profitable to divide large-scale orders into several tenders, reduce the float time to one week instead of two to four weeks and schedule purchases to coincide with seasonal lows in world market prices. Introducing a system to provide daily or at least weekly market information from the international grain exchanges could also help Bangladesh to make competitively-priced deals. Timing of purchases is critical for commercial importing, as well as for food aid if it is denominated in value terms (as is the case for U.S., Canadian, and Australian food aid). In this way, Bangladesh gained an additional 100,000 MT of wheat in FY91 from the U.S. through careful timing of PL480-Title III purchases to coincide with the July-August price decline. Taking advantage of seasonality in prices requires that bureaucratic procedures for authorization to tender for food aid be carefully scheduled to permit purchase at appropriate times. Food aid donors also have a responsibility to make Usual Marketing Requirements (UMRs) a meaningful tool for encouraging private sector trade in Bangladesh, and not just a useful means of disposal for surplus agricultural products. The justification for UMRs is to ensure that food aid does not disrupt private commerce, but given the Government monopoly on foodgrain imports in Bangladesh, they serve only to exacerbate the current account deficit and budget deficit through needless importing in years of abundant harvests. If Government retains its monopoly on importing, then UMRs should be abolished. However, there is no reason why the private sector could not fulfill the UMRs by importing 200,000 MT of wheat per annum, as long as their efforts are not crippled by Government market restrictions.

#### Shipping and Handling

170. In recent years, the MOF has opted largely for CIF contracts, where the supplier incurs all shipping costs. A review of CIF charges paid by Bangladesh in FY88-90 indicates that they are generally within the ranges quoted by the international grain exchanges. Only the FY90 Thai rice purchase appears to have a moderately inflated CIF charge. Although shipping costs appear to be in line with international standards, there appear to be serious inefficiencies in the handling of foodgrain imports once they reach port. These inefficiencies are related to: (i) lightering; (ii) discharge rates; and (iii) suboptimal use of silo facilities.

171. Lighterage : Since 1985, the MOF has contracted with a public enterprise, the Bangladesh Shipping Corporation (BSC), to act as sole agent for lightering of vessels carrying foodgrain imports. This service is performed for a fixed rate of US\$ 12.60/MT, payable in foreign currency. In FY90, lighterage fees cost the MOF an estimated US\$ 5.0-6.3 million, a figure which was more costly than it need be. Lighterage rates for imported fertilizers are currently US\$ 4.00-5.00/MT, and foodgrain is easier to handle than fertilizer, especially in bulk. Estimates made by private shipping firms for lightering of foodgrains are US\$ 4.50/MT to Chittagong's bulk silo and US\$ 6.75 to the Chittagong jetty--between one-third and one-half of the rate currently paid to BSC. In fact, these estimates are on the high side, having assumed maximum discharge times. Clearly, it would be more cost-effective for MOF to establish volume-based contracts for lightering services at competitive market rates, determined through a process of unrestricted tendering which could include BSC.

172. Discharge Rates: The daily discharge rate (DDR) stipulated in shipping contracts determines the vessel's expected unloading time, which is inversely related to the daily freight rate charged. The Government contracts on "free out" terms which give MOF the responsibility for discharging the ship. If discharge is slower than the stipulated DDR, then MOF must pay daily demurrage to the shipping line equal to the daily charter rate. If discharge is faster than stipulated, MOF receives despatch money from the shipping line for the unused time, usually equal to one-half the demurrage rate. If MOF consistently underestimates its DDR, it unnecessarily raises its total freight charges. Generally, the MOF stipulates a DDR of 1500 MT per day for bulk wheat, while many food aid donors stipulate 2000 MT per day. The latter rate is generally surpassed at Chittagong port, and, as a result, MOF and donors receive despatch money. By stipulating a much lower DDR, the MOF receives higher sums of despatch money, but overall pays more for shipping than donors do. For example, the savings possible by stipulating the higher DDR for a 40,000 MT bulk wheat shipment could be around US\$ 27,000. Sums such as this could be saved if MOF adopted a realistic DDR for Chittagong port, and did not require ships to discharge 60 percent of their consignment at Chittagong port and 40 percent at Chalna port. At Chalna, the lack of bulk facilities slows discharge, often to less than 1500 MT/day. While it is argued that foodgrains should be delivered there for ease of transport to the Western part of the country, the higher costs of unloading outweigh the transport differentials to destinations in the Northwest. Of course, if Government moves towards greater monetization of food aid and use of cash transfers for beneficiaries, then it would clearly be more efficient to discharge the entire consignment at Chittagong. While it may still be argued that a minimum security stock for the Khulna Division should be unloaded at Chalna, requiring ships to discharge 40 percent of their consignment at Chalna does not seem warranted. Nor does investment in bulk facilities at Chalna until the Chittagong facilities are fully utilized.

173. Maximizing Use of the Chittagong Silo: Maximizing use of the Chittagong silo will reduce handling costs dramatically, because: i) lightering onto the jetty is 50 percent more expensive than into the silo (if lightering were done at competitive market rates); and ii) stevedoring costs for the jetty are 30 times the costs of unloading by vacuvator into the silo. Through improved stock management, turnover can be raised for the existing silo facilities. If facilities are upgraded along the lines that were suggested by the IDA Foodgrain

Storage Project (Credit 381-BD) in 1987, virtually all imported wheat could flow through the silo. A detailed cost-benefit analysis of this proposed investment is beyond the scope of this report, but given Bangladesh's structural deficit in wheat, long-term investment in facilities for efficient import of wheat should be seriously studied. It should be noted that the private sector has expressed considerable interest in renting bins in the silo for storage of either purchased food aid or commercial imports. Maximum use of the silo will also resolve weightment problems associated with unloading on the jetty. Foodgrain flowing through the silo is automatically weighed as it is unloaded, but foodgrains unloaded at the jetty are manually bagged and a 10 percent sample is weighed. There is no means of standardizing bag weight, and overreporting of weight and/or pilferage is common. Until such time as all wheat imports flow through the silo, the jetties need to be equipped with hopper bagging units and crane scales to standardize bag weight, and administrative and security procedures need to be strengthened along the lines suggested by the GOB/FAO Reorganization Project.

### Transport

174. Policy reforms which are oriented toward private sector trade and marketing for rice price stabilization, as well as greater reliance on monetization of food aid, would substantially reduce the need for public sector transport of foodgrains within Bangladesh. Under existing policies, foodgrains for distribution are transported throughout the country to supply three inland silos, twelve central storage depots (CSDs) and more than 600 local storage depots (LSDs). Transport services are contracted at three levels: (i) central movement between divisions; (ii) divisional, or inter-district, movement between districts within a division; and (iii) regional, or intra-district movement within a district. Fixed transport rates are set by central, divisional and district tender committees, respectively, with little uniformity below the central level. Adequate data on divisional and regional transport activities were not available for this analysis, so that most of the following discussion focuses on central movement. There is, however, no reason to assume that divisional and regional transport is more efficient or more competitive than central movement. Indeed, it is a widely-shared perception that the awarding of foodgrain transport contracts at the division or district level is a source of political patronage that shows little regard for the efficiency of public resource use.

175. The Government's stated policy regarding stock levels is to keep three month's worth of PFDS offtake in storage at final consumption points. However, existing storage capacity was not determined on the basis of this criteria, so that capacity varies widely relative to offtake. On an aggregate level, the monthly average of total foodgrain stocks in recent years has been around 1.12 million MT, equal to between four and five months of average offtake. In FY90, with expanded procurement and sluggish ration sales, average stocks rose to nearly seven months of offtake. Storage planners had not anticipated a doubling of procurement in the Northwest, and the procured rice was often transported to areas with excess storage capacity (e.g. Patuakhali, Barisal) while awaiting transport to final distribution points. In addition, the ratio of central movement (i.e. from the port to inland silos or CSDs) of imported grains to total grain imported also rose from 1.18 in FY83 to 1.52 in FY90, meaning that half of all imports were moved twice in their journey to their "final" CSD, before being transported to local distribution points. Donor requirements that food aid wheat

be distributed in the FFW and VGD programs, even in zones of heavy rice procurement, led to simultaneous movement of domestic rice from north to south and food aid wheat from south to north. All in all, there appears to be considerable scope for rationalization of foodgrain transport to eliminate multiple stock movements. It will require more extensive forward planning of foodgrain movement than is currently undertaken, as well as rationalization of storage capacity. Agreement between GOB and donors on commodity swaps or other arrangements which increase the flexibility to distribute locally-held stocks under FFW and VGD should also be pursued.

176. In addition to minimizing the total distance covered, much can be done to reduce the current per kilometer cost of Government foodgrain transport. Three modes of transport are available: road, railway and river. Cost and speed of transport are inversely related, with road transport being the fastest and most expensive, followed by railway and then river. Road transport rose as a share of central movement from 33 percent in FY83 to 51 percent in FY90, with rail transport losing ground and river transport increasing modestly. While some increase in high-cost road transport could be expected in years with high levels of emergency intervention (such as during the FY88 and FY89 floods), it is difficult to justify continued use of road transport in years of abundant harvests, such as FY90. Least-cost modes of transport should have been selected for delivery of stocks for routine distribution. A policy of optimal, least-cost routing needs to be adopted, on the basis of a logistics plan for central movement. Currently the least-cost, river/road route between Chittagong port and Dhaka (the Tejgaon CSD), for example, is only about one-third the cost of road transport. However, this routing generally accounts for only 40-50 percent of the volume transported between these two points. In fact, with adequate planning, considerable savings on internal transport would be possible through routing of as much as 500,000 MT of imported foodgrains directly from Chittagong outer anchorage to inland silos by river.

177. Road Transport: Virtually all road transport of foodgrains is carried out by Central Road Transport Contractors (CRTC's), private sector intermediaries who usually hire trucks in the open market. The Directorate General of Food (DGF) awards contracts among more than 5600 CRTC's. However, the current system for awarding contracts is neither competitive nor cost efficient. The "tendering process" allows eligible CRTC's to bid either at the official transport rate or five percent below. No price competition is involved, and the criteria for awarding the contracts are unclear. Entry of new contractors into the ranks of the CRTC's is highly restricted. Transport rates are point-to-point rates, with widely varying implicit per mile rates which cannot be fully explained by road quality differentials. More disturbing than the variation in per mile rates is the level of fixed rates relative to rates in the open market: on the basis of extensive interviews with the Truck Owners' Association and independent truckers, it appears that the official rates are approximately double the competitive market rates for the same routes. Cost savings would be substantial if the MOF moved to a system of unrestricted tendering based on establishment of prequalification criteria and competitive bidding.

178. Rail transport: All rail transport is handled by Bangladesh Railways, a state-owned enterprise. Freight rates are distance-based, and were revised in June, 1990. At this time, the DGF introduced a system of private railway

handling contractors (RHCs) who are responsible for reducing pilferage of foodgrains during transport. The RHCs receive a 35 percent commission above the standard freight rates for their services. The earlier 20 percent surcharge has been reduced to eight percent, so that foodgrain transport rates are now 43 percent above rates for other goods. Not surprisingly, there has been an upturn in use of the railways for foodgrain transport this past year. Railway handling contractors still have the right to claim 0.5 percent "allowable losses", which they routinely do. No data exists on the actual level of losses, however. The DGF has reported total losses ranging from 3.2 to 5.5 percent of total foodgrain acquisition, but actual losses are impossible to estimate in the absence of proper inventory and financial accounting. From time to time, the DGF writes off large volumes (e.g. 150,000 MT) of unaccounted for grains. The 35 percent RHC commission appears to be an expensive inducement to keep losses at the allowable level for rail transport, and may motivate contractors from other modes of transport to increase their level of recorded losses in the hope of being offered similar inducements. Of course, the question remains unanswered why Bangladesh Railways itself cannot ensure the safe passage of public sector commodities. It would seem far more logical to dispense altogether with railway handlers, and award reasonable bonuses to Bangladesh Railways for good performance in reducing grain losses.

179. River Transport: River transport is carried out by the state-owned Bangladesh Inland Water Transport Corporation (BIWTC) and private sector contractors. Fixed freight rates are established by each division, and--unlike the rates for road transport--they are distance-based, with declining per kilometer rates as distance increases. However, the rate structures exhibit certain anomalies which should be rectified. For example, the rates for Dhaka division drop off precipitously beyond 80 kilometers, so that the total cost of carrying one metric ton for 80 Km is Tk 124, but for 81 Km is Tk 29. The magnitude of the rate decline undoubtedly discourages use of river transport for longer routes. This is a significant inefficiency in Government food operations given that freight rates by river are a fraction of the cost of road transport, and all inland silos and CSDs are situated on navigable waterways. With adequate forward planning, the bulk of imported foodgrains could be moved directly from the port to primary storage locations by river.

### Storage

180. Any judgment about the adequacy or inadequacy of existing storage capacity is highly dependent on the assumptions made about the nature of Government food operations in the future. The first step in "rationalizing" existing storage capacity is, therefore, to develop a vision of where food policy in Bangladesh is heading in the course of the next ten years. No reconfiguring of existing space, nor expansion of total capacity, can be justified in the absence of such a vision. The need for geographically dispersed public sector storage space would be dramatically altered if any or all of these policy recommendations were implemented: (i) replacement of the buffer stock system with an import/export stabilization fund for rice prices; (ii) establishment of the target price band for stabilization in line with world price trends; (iii) elimination of ration channels targeted to relatively well-off groups; or (iv) monetization of more food aid to provide cash transfers to beneficiaries. In the absence of these

policy changes, one can nonetheless identify inefficiencies in existing storage facilities and procedures that should be eliminated.

181. As the recent cyclone has once again demonstrated, Bangladesh remains extremely vulnerable to natural disasters which destroy crops, force people from their homes and increase the prevalence of acute malnutrition and infectious disease. It is the Government's duty to respond to these disasters with emergency shelter and food. Speed is of the essence, and the chief concern becomes the logistics of getting food to areas isolated by floods/cyclones. The maintenance of a large rolling stock of foodgrains in country--usually between 1.0 and 1.2 million MT--has been justified as a security stock for these emergency interventions. With a net foodgrain storage capacity of around 1.5 million MT, a lack of forward planning may result in temporary regional stock imbalances that usually lead to calls for construction of substantially more storage capacity. Two issues need to be addressed: (i) the rolling stock level relative to overall storage capacity; and (ii) the geographic distribution of existing storage capacity. With respect to the rolling stock level, it should be noted that the total distribution of foodgrains, even in the immediate aftermath of the devastating FY88 and FY89 floods, has never exceeded 300,000 MT/month, including routine distribution through monetized and non-monetized channels. Rice can be commercially imported into Bangladesh on an emergency basis in as little as five to six weeks, with internal transport to the distribution point adding at most two weeks additional time. Thus, reducing Government's rolling stock to a level equivalent to less than three months' maximum offtake--for a stock level of around 700,000 to 800,000 MT--would reduce storage costs without jeopardizing food security goals. Additional stocks raise the cost of food operations in terms of storage and handling, as well as in terms of the interest income foregone on the cash reserves used to procure stocks. On the basis of this reduced rolling stock level, expansion of total storage capacity above the existing 1.5 million MT is not warranted, and the Government's expansion target of 500,000 MT under the Fourth Five-Year Plan should be reconsidered.

182. Rationalizing the geographic distribution of security stocks will also allow a reduction in the rolling stock level. Areas most prone to flood/cyclone damage, and most likely to suffer from temporary segmentation of the foodgrain market, are identifiable, and should maintain the highest security stocks. Attempting to keep three to four months' worth of distribution stocked in all storage depots, as is now the practice, is not justified on food security grounds and places an unnecessary burden on the budget. The unanticipated rise in domestic procurement in FY90 also focused attention on the geographic distribution of Government storage facilities--or, more precisely, on the inadequacy of storage capacity in the northwest (Rajshahi division) relative to the volume of procurement. The existing configuration of storage capacity in Bangladesh evolved within the context of persistent foodgrain deficits, and was designed to facilitate the arrival of imported foodgrains and their distribution along a south-to-north axis throughout the country. Large-scale procurement as a form of price support was not envisioned. As a result, two-thirds of all silo and CSD capacity is found at or near the ports in Chittagong, Khulna and Narayanganj. Existing storage capacity in the Rajshahi division is around 370,000 MT, although procurement in the area exceeded 800,000 MT in FY90. This imbalance was the root cause of the excessive foodgrain movement in FY90, which

raised transport and handling costs. It also led to renewed calls for additional construction of storage facilities in procurement zones. This makes sense only if procurement on this scale is anticipated regularly in the future. Chapter IV recommended that Government opt instead for a stabilization policy based on private sector trade and a public sector stabilization fund, and that the target price band for stabilization of domestic prices be brought into line with trends in world market prices. Within this policy environment, Government procurement on the scale of FY90 would not occur, and the present configuration of storage space--with substantial bulk storage at the ports--would be appropriate for continued large-scale imports of wheat, whether through the public sector or private sector. If, however, Government continues to engage in open-ended procurement, then expanded storage capacity in the Northwest may be advisable.

183. This type of storage is not optimal for maintaining the quality of the stock. Storage experts consider it adequate for storing foodgrains with a 14 percent moisture content for relatively short periods of around three to five months. However, much of the foodgrain, especially the domestically-procured rice, enters the go-down at a higher moisture content, and subsequently deteriorates even faster. Restructuring the financial incentives offered by the Government to private rice millers will ameliorate this problem. However, even at the recommended 14 percent moisture content, bagged rice stocks will need to be rotated out of go-downs within three to four months, or deterioration will lead to large losses, as was the case in FY90. However, it must be recognized that rice procured in the wet season (mostly boro) and stored in stacked gunny bags can only be stored for three to four months before sustaining large losses due to deterioration. In other words, Government must turnover these stocks on a seasonal basis, even if seasonal price swings no longer warrant the release of these stocks in the domestic market. Steps can be taken to slow the deterioration of rice stocks. In particular, milling incentives should be restructured to encourage milling at a lower moisture content, and Government should follow a last-in-first-out principle (rather than a first-in-first-out principle) of inventory management for rice stocks procured in the wet season only. If the high-cost policy of open-ended domestic procurement continues, there are storage options that would permit longer-term storage of local rice. One option that has been proposed is to convert flat godowns into bulk storage facilities. Currently, with the exception of bulk storage in silos, most of the storage facilities consist of flat go-downs where grains are stored in stacked gunny bags. Another option is to develop public drying facilities. However, an investment in either of these two options is not warranted unless the policies prompting the investment can be shown to be financially sustainable and effective in achieving food security or agricultural goals. Open-ended procurement has not met either of these conditions.

#### Procurement

184. This report argues against domestic procurement as a form of price support for producers, preferring a more efficient, trade-based system. It promotes the use of cash transfers in distribution programs on efficiency grounds, as well. However, it is likely that Government will move gradually toward this latter goal, continuing to distribute foodgrain in targeted programs for some time to come. In these circumstances, the source of distributed grain should always be the least-cost alternative: food aid (which is always least expensive from the

Government's standpoint), commercial imports or domestic procurement. If domestic procurement is undertaken, much can be done to enhance the efficiency of the process. First, domestic procurement of wheat can be discontinued altogether. The rationale for wheat procurement is unclear: marketed production is small relative to domestic demand, and wheat production is largely unsuitable for the Bangladeshi climate and soil conditions. It would be ill-advised to promote additional production through price supports, and the Government routinely counteracts the intended effect of procurement by distributing large volumes of food aid wheat in wheat-producing areas during the procurement period. Privatization of the Government's industrial flour milling activities would also reduce the budgetary cost of wheat procurement and distribution. Second, Government can procure milled rice instead of paddy. Approximately 90 percent of rice procurement is in the form of paddy which is bought at the mill-gate, usually from the millers themselves or from traders. Very little is bought directly from farmers. MOF then pays a fee to private millers to convert the paddy into rice. Alternatively, MOF could simply purchase milled rice from millers and traders. Given the prevailing procurement prices and milling fees, this would be the more cost-effective option, reducing the cost of rice procurement by nearly 8.0 percent. Both options have the same impact on farmers--they continue to receive the going market rate for their paddy from millers and traders--but the millers and traders benefit more from the paddy option than from the rice option. In addition to the pricing differential, the paddy option allows millers to increase the return on Government milling by any one of the following methods: (i) exceeding the stipulated conversion ratio and selling the excess rice on the open market; (ii) milling heavy (high moisture) rice to fill weight-based contracts for Government; (iii) using Government paddy for sale on the open market and returning lower-quality rice to the MOF; and (iv) keeping new gunny bags provided by MOF and returning rice in worn bags.

185. A third way to reduce the cost and enhance the efficiency of procurement would be to procure at the going market price rather than at an official procurement price, regardless of whether procurement is being used as an explicit price support, or simply to fulfill the needs of distribution programs. It is clear that under the present system, farmers receive the going market rate, and procurement is justified by its impact on aggregate demand, which places upward pressure on market prices. Government purchases of milled rice at market prices will have the same impact on aggregate demand, but at a reduced budgetary cost. Buying at the official procurement price merely serves to raise the return to millers and traders. A fourth means of reducing procurement costs is to reduce losses due to spoilage. This is largely a question of moisture content and storage methods. The Government specifies a 14 percent moisture content for its procurement, but this is often unenforced, and is probably irrelevant because once purchased, the moisture content will rise to the equilibrium level, which is likely to be 15.0-15.5 percent in the wet season. A possible solution--in contrast to the recommendation to procure only milled rice--would be to store grains procured in the wet season (mostly boro) as paddy, which can be stored up to six months with little loss of quality. The negative aspects of this solution are that: (i) paddy requires significantly more storage space than milled rice, and (ii) storing paddy for later milling would increase transport costs to and from the mill. The pros and cons of storing paddy would have to be carefully weighed. If, as recommended, Government procures only enough to supply its distribution programs, and is not providing an open-ended price support, then

liquidation of stocks within three or four months would not be a problem, and storage of paddy would be unnecessary.

### Sales and Distribution

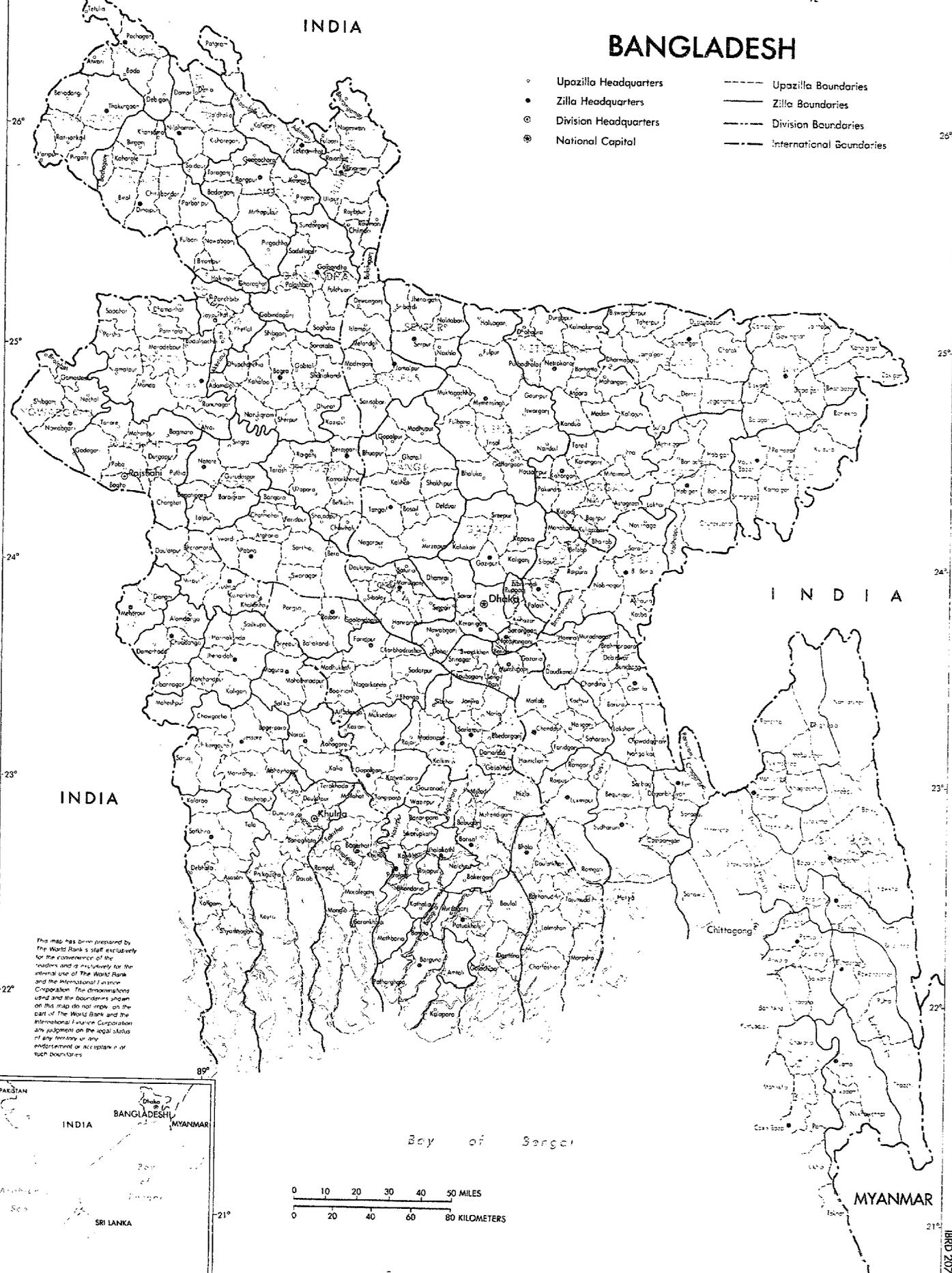
186. Many of the major sources of inefficiency in the foodgrain distribution system were discussed in Chapter V, and the policy recommendations from that chapter would serve not only to make targeted programs a more effective tool for reaching the food insecure, but also to reduce their budgetary cost and increase the efficiency of Government operations. Cost savings would be generated with no sacrifice of food security by: (i) eliminating ration channels targeted toward relatively well-off groups; (ii) discontinuing distribution of non-essential commodities such as oil, sugar and salt; (iii) increasing the flexibility of foodstock use so that locally-procured grains can be distributed under the VGD and FFW programs; (iv) increasing the monetization of food aid to provide cash transfers to beneficiaries and cash inputs for development initiatives; and (v) reducing the rolling stock level for foodgrains to between 700,000 and 800,000 MT.

187. Many of the inefficiencies inherent in a subsidized rationing system represent costs for the intended beneficiaries rather than for the Government. This includes widespread abuse in the distribution of ration cards, pricing of rations and the weighing of foodstuffs. It has been argued that the margin allowed to private retailers to cover the cost of transport and handling from the LSD to the retail shop (Tk 160/MT since 1983) is insufficient, and that this spurs retailers to enhance their returns from ration sales in any way possible. While review of the margin may be in order, the best way to eliminate abuses in ration sales is to gradually phase out subsidized sales programs in favor of: (i) open market sales to moderate extreme price increases; and (ii) self-targeting programs which require some kind of active participation by the beneficiaries. With a trade-based system of price stabilization coupled with an import/export stabilization fund, the need for open market sales should be rare. However, if they do become necessary, they should be undertaken at market prices instead of at the official OMS price. This would generate additional revenues for the food budget while having the same impact on aggregate supply and eliminating an inefficient, two-tiered pricing structure. As long as subsidized ration sales continue, some abuse is inevitable, particularly when beneficiaries are poor, illiterate and lacking the power to oppose local patrons. Abuse can be minimized through strengthening of financial and inventory accounting systems at the local level, education campaigns to make beneficiaries aware of their entitlement, random spot checks of ration shops to check weighing equipment and bag weight, and random surveys of beneficiaries.

# INDIA

# BANGLADESH

- Upazilla Headquarters
- Zilla Headquarters
- ⊙ Division Headquarters
- ⊕ National Capital
- Upazilla Boundaries
- Zilla Boundaries
- - - Division Boundaries
- International Boundaries



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