



# Income Growth, Safety Nets, and Public Food Distribution

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# **INCOME GROWTH, SAFETY NETS, AND PUBLIC FOOD DISTRIBUTION**

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## EXECUTIVE SUMMARY

Sustainable poverty reduction requires broad-based, employment-generating economic growth. Poverty reduction also requires the development of human capital to empower the poor to participate in the growth process. In developing countries like Bangladesh, where most of the poor reside in rural areas and receive a large share of their incomes from agriculture, agricultural growth is two to four times more effective than growth in other sectors in alleviating poverty. Bangladesh has historically relied on growth in rice—the country’s major crop in terms of area cultivated and income generated (or, value added). Future agricultural growth, however, will likely need to increasingly emphasize higher-value crops, as well as fish, poultry, and dairy products, in part because of land constraints. Priority investment areas for achieving higher income growth would include:

- accelerating pro-poor economic growth by promoting and stabilizing agricultural growth through investments for developing the high-value crop and noncrop agricultural sectors and rural infrastructure,
- creating rural nonfarm employment opportunities in higher productivity sectors, specifically by developing small and medium enterprises, and
- developing human capital through education, health and nutrition of the people, and promoting public–private partnerships for complementary investments in these areas.

Social safety nets in Bangladesh have been quite effective in smoothing the consumption and the income of poor households and helping them cope with stresses and shocks. These programs, however, cover only a fraction of the poor, and they must be strengthened if they are to adequately address poverty or mitigate the vulnerability to poverty in a sustainable way. Safety nets will become even more important in Bangladesh as the country faces economic downturn, food price fluctuations, climate change, and other developments that increase the vulnerability of the poor.

The idea of establishing a comprehensive multi-donor, multi-year safety net enhancement program merits consideration. Priority investment areas for strengthening the safety net system in Bangladesh would include:

- improving the targeting performance;
- increasing program coverage;
- scaling up effective programs;
- ensuring sustainability of program benefits;
- integrating investments in human capital creation into safety nets through targeted education, health, and nutrition interventions;
- consolidating and simplifying programs and phasing out high-cost, inefficient programs;
- exploring promising new programs and the use of suitable technology;
- improving the monitoring and evaluation system; and
- moving beyond coping approaches (safety nets) to risk-reduction approaches (social protection).

The Public Food Distribution System in Bangladesh has four key functions: (1) to supply foodgrains to various food-based safety nets; (2) to provide price incentives to Bangladeshi farmers for increased production through domestic procurement of rice and wheat; (3) to maintain a security stock of foodgrains to meet emergencies; and (4) to stabilize market prices in order to prevent excessive price

rises. The priority areas of intervention and investment options for improving the performance of PFDS would include, among others, the following:

- speeding up the computerization of food stock/storage monitoring systems,
- proper management of public storage expansion and exploration of opportunities for public–private partnerships in expanding the capacity of food storage facilities,
- research in public foodgrain stock management,
- continued support for the development of an effective early warning information system, and
- sustained capacity development of PFDS officials through local and international training.

## INTRODUCTION

Poverty and food insecurity are interlinked. The most startling consequence of widespread poverty in Bangladesh is that a quarter of the country's population cannot afford an adequate diet. The poor do not have adequate purchasing power to secure their access to food, even when food is available in local markets. Moreover, the poor are vulnerable to shocks (such as natural disasters or crop failures) that cause sudden losses of real income, and, hence, transitory food insecurity. Sudden increases in food prices, such as the surge in 2007–08, also result in transitory food insecurity, particularly for low-income households, by reducing their real income. Family coping strategies (such as the consumption of less food, the withdrawal of children from school, and the distress sale of productive assets) often aggravate the risks of destitution.

Bangladesh has achieved a modest reduction in the headcount poverty rate (that is, the percentage of population below the poverty line) since the early 1990s. However, given population growth, the absolute number of poor has increased considerably over the past two decades. In the years ahead, the rate of poverty reduction will have to be much faster than the rate of population growth to achieve any meaningful reduction in the number of poor. Furthermore, the rapid urbanization of Bangladesh calls for effective measures to tackle urban poverty and food insecurity.

Social safety nets in Bangladesh play an important role in augmenting the incomes of the poor and helping them cope with stresses and shocks. These programs have been quite effective in smoothing consumption and the incomes of beneficiaries. However, safety net programs cover only a fraction of the extreme poor, and they must be strengthened if they are to adequately address poverty or mitigate the vulnerability to poverty.

The largest safety net programs in Bangladesh are food based. The Public Food Distribution System (PFDS) supplies foodgrains to various food-based safety nets, which account for around three-quarters of its total food distribution. These safety net programs contribute to income and employment generation for the poor as well as development of human capital and infrastructure resources. The PFDS also has other key functions: (1) to provide price incentives to Bangladeshi farmers for increased production through domestic procurement of rice and wheat; (2) to maintain a security stock of foodgrains to meet emergencies; and (3) to stabilize market prices in order to prevent excessive price rises. Critical issues in the PFDS include methods of procuring foodgrains, size of buffer stock, stock rotation and management, and transit and storage losses.

## INCOME GROWTH

Sustainable poverty reduction requires broad-based, employment-generating economic growth. Poverty reduction also requires the development of human capital to empower the poor to participate in the growth process. In developing countries like Bangladesh, where most of the poor reside in rural areas and receive a large share of their incomes from agriculture, agricultural growth is two to four times more effective in alleviating poverty than is growth in other sectors (World Bank 2008a). This large poverty-reducing effect derives not only from the direct effects of raising agricultural incomes, but also from forward and backward growth linkage effects (Mellor 1976, 1992; Haggblade, Hazell, and Reardon 2007). Forward linkages result from the increases in spending of farm households on various goods and services, including those produced in the rural nonfarm and small urban economies. Backward linkages result from increased demand for agricultural inputs such as farm machinery and fertilizer, both of which entail substantial incomes for the trade and transport sectors.

The effects of agricultural growth on income distribution and poverty reduction depend on three factors: 1) the rate of agricultural growth; 2) the size of the multiplier effects on output of other sectors, and 3) the distribution of the value added generated in both the agricultural and nonagricultural sectors. In Bangladesh, given the relatively equal distribution of land (at least among farmers), the direct gains of agricultural production are also relatively equally distributed across farm households. As will be discussed below, the multiplier effects of agricultural growth and accompanying investments in processing activities are significant, as well. The extent to which rural landless households (agricultural landless and the rural nonfarm households) gain from this economic growth, however, depends on to a large extent on the location of economic activity and thus, on which rural households share in the gains from this increased economic activity.

## Accelerating agricultural growth

Bangladesh has historically relied on growth in rice, its major crop in terms of area cultivated and income (value added) generated. Future growth, however, will likely need to increasingly emphasize higher-value crops, as well as fish, poultry, and dairy products. In part, this is because there is essentially no scope for increased crop area cultivated. Thus, further increases in rice production will require increases in yields. This, of course, suggests the continuing need for high-quality agricultural research and extension services. Diversification of agriculture toward higher-value products is also needed because increased rice production is likely to lead to decreases in real rice prices, thus dampening income gains, but improving the welfare of net rice consumers (Dorosh, Shahabuddin, and Rahman 2002; Arndt et al. 2002; Dorosh 2006). Fish, poultry, and dairy products offer substantial potential for accelerated growth. Although there are important constraints on the supply side, the high income elasticity of demand (the large share of increased household income that is spent on these products) suggests that there is unlikely to be a major constraint on the demand side for these products. Improvements in marketing are also needed, particularly for perishable commodities such as fruits and vegetables and fish products (World Bank 2007).

## Multiplier effects of growth

The contribution of agricultural growth to gains in rural and national incomes is not limited just to increases in farm incomes. Increases in agricultural production generally also involve increased demand for agricultural inputs, processing, and marketing services. In addition, as household incomes rise, consumer demand for both urban and rural products and services increases. To the extent that the supply of goods and services is

elastic, these initial increases in demand can spur increases in production and further increases in demand.

These multiplier effects of agricultural growth (as well as growth originating in other sectors) can be estimated using a semi-input-output (SIO) model based on a social accounting matrix (SAM) that takes into account the flows of payments and receipts of production activities, commodities, factors of production, households, and other institutions. In the Bangladesh SIO model, the output of tradable goods (rice, wheat, livestock, shrimp, food processing, textiles, and other industrial products) is assumed to be fixed (completely inelastic), and does not expand as a result of increased demand. For these products, increased demand results in increased net imports. For elastically supplied products (such as other crops, poultry, fish, construction, and services), increased demand is assumed to result in increases in output.

Table 1 shows the effects of a 1 taka<sup>11</sup> (Tk) increase in value added from the various tradable goods sectors. On average, a Tk 1 increase in the output of tradable goods in Bangladesh leads to a further Tk 1.07 increase in value added from nontraded goods and services. This gain is due mainly to consumer spending effects as incomes earned in various activities are spent in the domestic economy. In general, agricultural growth multipliers are large (0.96 for both paddy and livestock, and 0.82 for shrimp). Thus, accelerated growth in agriculture has the potential to lead to substantial growth in the rural nonfarm economy and in the nontradable sectors. Multipliers are smallest in sectors such as knitwear, where there are few production linkages, since most of the inputs are imported and most of the outputs are exported. The multiplier for the food industry is especially large because of major backward production linkages to the nontradable crops sector (which includes pulses, fruits, and vegetables).

**Table 1—Multiplier effects of a 1 taka increase in value added in various sectors**

	Value Added Multiplier	Change in Value Added	Change in Household Income			
			All HHs	Agric HHs	Rural Non Farm HHs	Urban
<b>Paddy</b>	0.96	1.96	1.42	0.74	0.32	0.37
<b>Grains</b>	0.56	1.56	1.24	0.63	0.27	0.34
<b>Livestock</b>	0.96	1.96	1.55	0.91	0.35	0.28
<b>Shrimp</b>	0.82	1.82	1.09	0.60	0.24	0.25
<b>Food Industry</b>	1.43	2.43	2.23	0.94	0.52	0.77
<b>RMG</b>	0.85	1.85	1.07	0.33	0.27	0.47
<b>Knitwear</b>	0.44	1.44	0.38	0.12	0.09	0.17
<b>Other Industry</b>	0.74	1.74	1.17	0.39	0.28	0.50
<b>Utilities</b>	0.55	1.55	0.66	0.18	0.15	0.33

Source: Calculated from 2005 Bangladesh SAM.

\* All references to taka (Tk), the currency of Bangladesh, are on the official exchange rate as of May 20, 2010: Tk 69.35 per US\$1

**Table 2—Size and expenditures of major household groups, 2005**

	Households (mns)	Expenditures (taka/person)	Population (mns)	Population share	Expend (bns)	Exp share
<b>Agric Laborers</b>	3.80	741	17.04	0.123	12.6	0.077
<b>Marginal Farmers</b>	2.16	1009	10.72	0.077	10.8	0.066
<b>Small Farmers</b>	3.60	1125	18.89	0.136	21.3	0.129
<b>Large Farmers</b>	1.31	1476	8.22	0.059	12.1	0.074
<b>Rural Nonfarm L50</b>	4.65	678	23.44	0.169	15.9	0.097
<b>Rural Nonfarm U50</b>	5.87	1526	26.18	0.189	40.0	0.243
<b>Urban Low Education</b>	3.56	1045	16.82	0.121	17.6	0.107
<b>Urban High Education</b>	2.31	1937	17.50	0.126	33.9	0.206
<b>Total Rural</b>	21.38	1078.29	104.50	0.75	112.69	0.686
<b>Total Urban</b>	7.26	1499.91	34.32	0.25	51.48	0.314
<b>Total Bangladesh</b>	28.64	1182.58	138.82	1.000	164.16	1.000

Source: Calculated from 2005 Bangladesh SAM.

Note: Rural households are classified on the basis of occupation of the household head (landless agricultural laborer, farmer, or nonfarmer) and acres of land owned (0–0.49, 0.50–2.49, more than 2.49 hectares). Urban households are split according to education of the household head (up to class V; greater than class V).

## The distribution of income

As shown in Table 2, households headed by rural landless laborers (12.3 percent), marginal farmers (7.7 percent), and the rural nonfarm poor (16.9 percent) make up an estimated 37 percent of the population of Bangladesh and account for most of Bangladesh's poor. Because these households are among the primary beneficiaries of agricultural growth and rural nonfarm growth linkages, agricultural growth has a large potential to reduce poverty.

As shown in Table 2, agricultural households (including agricultural laborers) reap most of the benefits of agriculture-led growth. They also benefit from industrial growth, though to a lesser degree, since they gain almost exclusively from the multiplier effects alone, and not from the direct effects of increases in industrial output and employment. The exception is the food industry. Though there are again only limited direct effects of increases in food industry output on agricultural household incomes, the indirect effects on nontradable agriculture are very large, so that a 1 *taka* increase in value added of the food industry results in a 0.94 *taka* gain in agricultural household incomes.

This distribution of the benefits of increased economic output depends on the ownership of the factors of production (land, labor, and capital). Most of the returns to agricultural land (including agricultural capital) accrue to small and large farmers (estimated 0.245 and 0.305 shares, respectively), though rural nonfarmers and the urban nonpoor also receive significant shares of agricultural land incomes (0.181 and 0.092), largely through land rents. Note, however, that the location of activities is significant for local labor markets and especially for returns to capital and backward linkages to agriculture. Investment in food processing for highly perishable fruits and vegetables will tend to benefit agricultural producers close to the factory; more isolated producers will see little increase in demand for their products

and the multiplier effects in their areas may be extremely small. The implication is that including much of the rural poor in the benefits of overall growth and in investments in food processing in particular will require that these households are well integrated into the product and factor markets where the investments take place.

## Other drivers of rural income growth: Workers' remittances and urban incomes

In principle, growth in any sector of the economy can generate positive linkage effects on the rural economy and rural households. Thus, rapid growth in urban areas spurs demand for food, other agricultural goods, and even rural nonfarm services. Likewise, international migration and remittances (mainly from the Gulf, Malaysia, and Japan) add to incomes and can generate growth multiplier effects throughout the economy. The distribution of the benefits of these income transfers from abroad depends crucially on which households receive the transfers and on which sectors of the economy these transfers are spent. The international evidence nonetheless suggests that agricultural growth is generally more effective in reducing poverty in developing countries than are these sources of income growth.

## Priority investment areas

Priority investment areas for achieving higher income growth in Bangladesh include:

1. *Accelerating pro-poor economic growth by promoting and stabilizing agricultural growth.* This involves further developing the high-value crop and noncrop agriculture sectors, as well as improving rural roads and market infrastructure.
2. *Creating rural nonfarm employment opportunities in*

*higher productivity sectors.* For this, the development of the agribusiness and agro-processing sectors is needed, as is the provision of access to finance for small and medium enterprises (SME).

3. *Developing human capital through education, health, and nutrition of the people.* Promoting the public-private partnership (PPP) for complementary investments in these areas would be beneficial.

## SAFETY NETS

### Background

There is a general agreement that the foundation for poverty reduction is broad-based, employment-generating economic growth. Poverty reduction also requires the development of human capital to empower the poor to participate in the growth process and the strengthening of social safety nets to protect the vulnerable from the worst effects of poverty. If well-designed safety net programs can effectively increase the real incomes of the poorest people, then such programs are justified. There may be scope for designing safety net programs that can actually contribute to human capital development and economic growth as well.

Safety nets are formal and informal ways of protecting people from destitution. Formal safety nets include various transfer programs designed to play both a redistributive and risk reduction role. The traditional role of safety nets is to redistribute income and resources to the needy in society, so that the impact of poverty is reduced. A more recently identified role of safety nets is to help protect individuals, households, and communities against income and consumption risks.

Bangladesh's progress in economic growth has contributed to a modest reduction in the headcount poverty rate of around 1.5 percentage points a year since the early 1990s. This progress in poverty reduction is, however, of little comfort since the overall incidence of poverty persists at a high level. The most startling consequence of widespread poverty is that one-fourth of the country's population cannot afford an adequate diet, according to the 2005 estimates of food poverty (BBS 2006). Chronically underfed and highly vulnerable, this segment of the population remains largely without assets (other than its own labor power) to cushion lean-season hunger or the crushing blows of illness, flooding, and other calamities. The need for targeted safety net interventions to improve the food security and livelihoods of the extreme poor therefore remains strong.

Bangladesh possesses significant experiences in providing assistance to the poor through social safety net programs. Although some of the programs started as early as mid-1970s, the administrative structure and the implementation mechanisms have gone through substantive changes over the years. The most notable changes include transforming relief programs

to development programs, converting ration price subsidies to targeted food distribution, and engaging other stakeholders—such as nongovernmental organizations (NGOs) and micro-finance organizations—in the implementation of various safety net programs.

### Characterization of social safety net programs in Bangladesh

Bangladesh has a comprehensive portfolio of both food- and cash-based social safety net programs. Currently, there are about 58 such programs.<sup>2</sup> The safety net programs can be categorized in accordance with the specific objective that each program is designed to achieve. For example, programs may be designed to develop infrastructure, provide education incentives to the poor, mitigate disaster consequences, or provide livelihood support to disadvantaged groups such as the aged and the disabled. Using these categorizations, it is possible to group existing programs in Bangladesh into five categories.

*Infrastructure-building programs:* Food-for-work (FFW) or Rural Development (RD) programs—and Test Relief (TR) distribute foodgrains (rice and wheat) as wage payment to both male and female workers in labor-intensive public works programs. The Rural Employment Opportunity for Public Asset (REOPA) program—a follow-up to the Rural Maintenance Program (RMP)—provides cash wages and training for income-generating activities to participating women. Recently, the Government of Bangladesh also introduced a massive safety net program called the Employment Generation for Hard Core Poor. All these programs require participants to do physical work for building and maintaining rural infrastructure. They are generally self-targeting because the poor are typically the only people willing to take on onerous, low-paying jobs requiring manual labor.

*Training programs:* The Vulnerable Group Development (VGD) program exclusively targets poor women and provides a monthly food ration for 24 months. Although it was introduced as a relief program in the mid-1970s, it has evolved over time to integrate food security with development objectives. The development package includes training on income-generating activities; awareness-raising for social, legal, health, and nutrition issues; and basic literacy and innumeracy. Beneficiaries of VGD programs are selected by administrative review.

*Education programs:* The Food for Education (FFE) program distributed monthly foodgrain rations to poor households if they sent their children to primary schools. FFE was terminated in 2002 and has been replaced by the cash-based Primary Education Stipend (PES) program. The School Feeding (SF) program distributes micronutrient-fortified energy biscuits to primary school children. These programs have the common development

<sup>2</sup> Interventions to improve the nutrition of children and women are excluded from the list of safety nets, since these programs do not fall directly under the rubric of transfer programs.

objectives of promoting school enrollment and attendance and reducing dropouts. In addition, the school feeding program aims to improve students' attention span and learning capacity by reducing short-term hunger and micronutrient deficiency. The Government of Bangladesh also provided cash assistance to girls in secondary schools through the Female Secondary School Assistance Program (FSSAP). The program was redesigned in 2008 and renamed the Secondary Education Access and Quality Enhance Program, which includes boys from poor families as well as girls.

*Relief programs:* These programs are designed as a mechanism for mitigating the consequences of disasters like floods, cyclones, and other natural calamities. Currently, there are only two such programs: Vulnerable Group Feeding (VGF) and Gratuitous Relief (GR) programs. Unlike other programs, these programs have no pre-set criteria or conditionality for participation. They are relief programs that try to help the poor cope during times of natural disaster and smooth their consumption.

*Programs for other disadvantaged groups:* These programs include the Old-Age Allowance Scheme; Allowance for Widowed, Deserted, and Destitute Women; Honorarium Program for Insolvent Freedom Fighters; Fund for Housing for the Distressed; Fund for Rehabilitation of Acid Burnt Women and Physically Handicapped; and Allowance for the Distressed and Disabled Persons.

The key message is that the safety net system in Bangladesh has evolved from being relief oriented to incorporating various components of long-term development objectives. The government has formed strong partnerships with NGOs and multilateral and bilateral development organizations in implementing them.

Nevertheless, important issues and challenges remain. The existing safety net programs cover only a fraction of the poor, and they must be strengthened if they are to adequately address poverty or mitigate the vulnerability to poverty in a sustainable way. Most safety net programs in Bangladesh address economic vulnerability but pay little attention to demographic vulnerability. The demographically vulnerable—including children, the elderly, and those who are severely disabled or chronically ill—are often not able to perform the intense physical labor involved in cash- or food-based public works programs. They need more than a short-term safety net; rather, a broader social protection system is required for them. Programs that involve providing allowances to elderly and disabled people are a start, but coverage and transfer amounts are currently inadequate. There is also a lack of safety nets available to the urban poor. Between 2000 and 2005 the total number of urban poor increased by 4.3 million. The rapid urbanization of Bangladesh calls for a range of measures to tackle urban food insecurity; a strong safety net or social protection system for the urban poor is an important one.

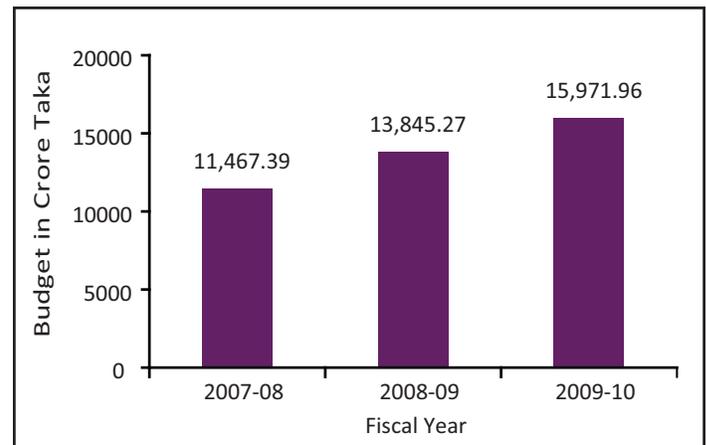
## Safety net coverage and the government budget

While Bangladesh needs comprehensive appraisal of the actual coverage of social safety net programs, available estimates suggest that millions of food insecure people still remain uncovered. According to the fiscal year (FY) 2009–10 budget, 6.9 million families—or, 27 percent of the population—will be covered under the current national safety net system. With a poverty head count of 40 percent, this leaves 13 percent of those in need uncovered. Given the targeting errors, however, the actual coverage of the poor would be considerably lower.

Allocations of budgetary resources to public safety net programs are available only for recent years. Figure 1 shows the government's budget allocations for public safety nets from FY2008 to FY2010. The allocation increased substantially in FY2009 and FY2010, mainly due to the introduction of the 100-Day Employment Generation Program in September 2008 created to mitigate the adverse impact of the 2007–08 food price crisis and the recently introduced Employment Generation of Hard Core Poor program. The allocation for the safety net system in FY2010 is Tk 15,971.96 crore (US\$2.3 billion), which represents 2.8 percent of the gross domestic product (GDP).

For food-based safety nets, the government distributed 2.1 million metric tons of foodgrains in FY2009 and allocated 2.7 million metric tons in FY2010.

**Figure 1—Government of Bangladesh budget for safety net programs**



Source: Finance Division, Ministry of Finance.

In comparative terms, developed countries spend a larger share of their GDP on safety nets than do developing countries. For example, the European Union spends about 19 percent of their GDP on safety nets, while the United States spends about 9 percent. On the whole, South Asia's expenditure on social safety nets is among the lowest in the world. In 2004, India spent 4.3 percent of its GDP on safety nets; Sri Lanka, 3.0 percent; and Pakistan 1.8 percent.

## Performance of selected programs

The Government of Bangladesh has shown a remarkable willingness to evaluate program effectiveness, confront shortcomings, and cancel or modify programs if necessary. For example, the high cost of subsidies and heavy leakage to the nonpoor motivated the government to abolish the *Palli* (rural) rationing program in 1992 (Ahmed 1992). The government replaced *Palli* rationing with the innovative Food for Education (FFE) program in 1993 (WGTFI 1994).

In more recent years, the International Food Policy Research Institute (IFPRI) studied four safety net programs in Bangladesh using rigorous methods of evaluation. The performance of some of the key programs is highlighted below.

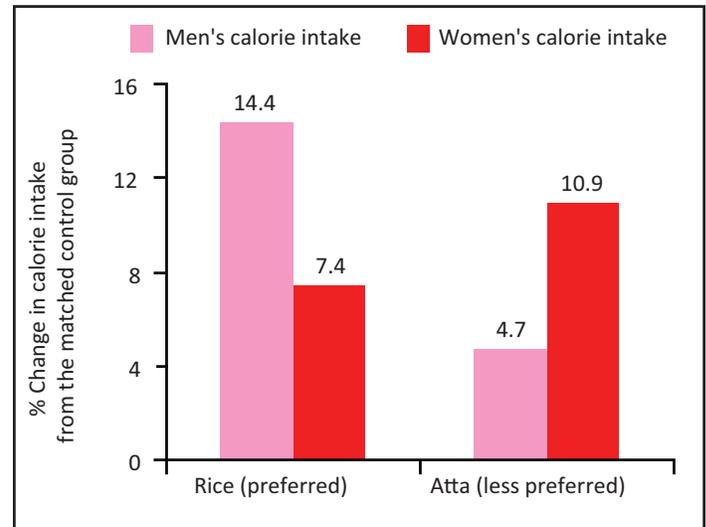
### Transferring food and cash to the ultra poor in Bangladesh

What makes a more effective social safety net program: transfers of food, or cash, or both? Cash transfers are cheaper, require less administrative capacity, and allow poor households to decide how the money should be spent. But are they always the most effective means of improving the lives and livelihoods of the ultra poor?

Bangladesh has some safety net programs that transfer food to the poor, some that transfer cash, and some that provide a combination of both. To help determine the relative effectiveness of food and cash transfers, a recent IFPRI study examined the efficacy of both types of transfers in enhancing the food security and livelihoods of the ultra poor in rural Bangladesh (Ahmed et al. 2009). The evaluation assessed how well transfers were delivered; which transfers beneficiaries preferred; how well transfers were targeted; what effects the transfers had on food security, livelihoods, and gender-related outcomes; and how cost effective the transfers were.

The evaluation focused on four interventions: (1) the Income-Generating Vulnerable Group Development (IGVGD) program, which provides food transfers; (2) the Food Security Vulnerable Group Development (FSVGD) program, which provides a combination of food and cash transfers; (3) the Food for Asset Creation (FFA) component of the Integrated Food Security (IFS) program, which also provides both food and cash transfers; and (4) the Rural Maintenance Program (RMP), which provides cash transfers. In 2006, these programs covered 830,840 beneficiaries with 3.72 million family members. Based on full entitlements, the estimated annual total costs of transfers (that is, the value of transfer plus delivery cost) in 2006 were Tk 342.4 crore (US\$49.58 million) for IGVGD; Tk 48.5 crore (US\$7.02 million) for FSVGD; Tk 40.2 crore (US\$5.83 million) for FFA; and Tk 76.3 crore (US\$11.05 million) for RMP. The total transfer cost of all four programs was Tk 507.3 crore or US\$73.47 million. The annual total costs of transfers per beneficiary (based on full entitlements)

Figure 2—Form of food transfer affects intrahousehold food distribution



Source: Ahmed et al. 2009.

were Tk 5,343 (US\$77.38) for IGVGD; Tk 4,431 (US\$64.17) for FSVGD; Tk 10,266 (US\$148.67) for FFA; and Tk 18,360 (US\$265.89) for RMP.

Does a beneficiary household's level of income influence the beneficiary's preference for food or cash? The results suggest that, as income increases, beneficiary preferences for food declines, indicating that the poorest households prefer only food as the transfer. Conversely, relatively better-off beneficiaries tend to prefer only cash. Food is preferable over cash particularly during and immediately after disasters when market access becomes difficult even if the people have money in their hands.

The form of food transfer also has an effect on who benefits within the household: The food interventions that provide rice (IGVGD and FFA) have a larger effect on men's caloric intake relative to women's, whereas the converse is true for the one intervention that provides *atta* whole-wheat flour (FSVGD). Here, the use of a less preferred food—*atta*—increases the share of the food that goes to women relative to men (Figure 2).

It is assuring to note from the study that income transfers from these four major safety net programs are playing an important role in improving food security and protecting and expanding the asset bases of poor households. However, the results suggest there is an urgent need for revisions within the current portfolio of the social safety net programs.

The size of the transfer clearly matters, and so does the access to microcredit and savings offered by NGOs to program beneficiaries. Increasing the size of transfers and the length of assistance, as well as strengthening access to microcredit and savings services, is critical to achieving sustainable improvements in the food security and livelihoods of the ultra poor.

There is considerable scope for improving the targeting performance of the programs as well. Currently, these programs rely in part on selection criteria that are neither observable nor verifiable.

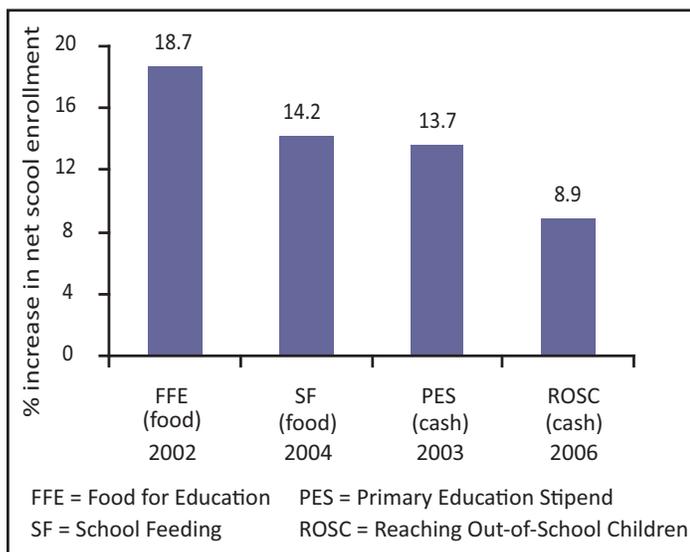
Although the onerous work requirements may contribute to the especially good targeting performance of the FFA intervention, these requirements also limit its impact in terms of poverty reduction and reduce its cost-effectiveness.

### Transfers for providing education incentives

Poverty has kept generations of Bangladeshi families from sending their children to school. Because day-to-day survival has to be their first priority, families often cannot provide children with educational opportunities that could help lift them from destitution. The Government of Bangladesh devotes a significant share of its budget to providing incentives to families to send their children to school. How effective are these programs in improving educational attainment of children from poor families?

In the past several years, IFPRI has conducted comprehensive surveys of households, schools, and service providers to evaluate the education incentive programs in Bangladesh (Ahmed 2004a, 2004b, 2005b, 2006; Ahmed and del Ninno 2005). Drawing on these evaluations, Figure 3 shows the impacts of these programs on school enrollment.

**Figure 3—Impact of programs on net primary education enrollment rates**



Source: Ahmed 2004a, 2004b, 2005b, 2006; Ahmed and del Ninno 2005.

The Food for Education (FFE) program provided a free monthly ration of foodgrains (rice or wheat) to poor families in rural areas if their children attended primary school. In 2002, the Primary Education Stipend (PES) program, which provides cash assistance to poor families if they send their children to school,

replaced the FFE program. Both the FFE and PES programs increased school enrollment. The rate of increase in enrollment was greater for FFE in 2002 than for PES in 2003 (see Figure 3). Over time, however, the impact of PES on enrollment became insignificant due to the decline of the real value of the fixed cash stipend. FFE increased household food consumption, but PES did not. The targeting performance of both programs was unsatisfactory. The targeting errors of exclusion (leaving out those who are needy) and inclusion (providing benefits to those who do not need them) were quite large for both programs.

In 2002, the Government of Bangladesh and the World Food Programme (WFP) launched the School Feeding (SF) program. SF provided a mid-morning snack consisting of nutrient-fortified wheat biscuits that contained 75 percent of the recommended daily allowance of vitamins and minerals of children. SF significantly increased rates of school enrollment and attendance and reduced dropout. The program also substantially improved the diet of the children in the program. The research provided evidence that the SF improved the attention span and learning capacity of students by reducing short-term hunger in the classroom. Participation in the program increased test scores, and students did especially well in mathematics.

The government also provides cash assistance to girls in secondary schools. The Female Secondary School Assistance Program has been extremely successful in removing the gender disparity in secondary education. In fact, girls significantly overtake boys in secondary school enrollment—a rare phenomenon among developing countries.

### Linking the issues to the policy framework: Interventions to strengthen safety nets in Bangladesh

The view of the WFP in Bangladesh of having a comprehensive multi-donor multi-year safety net enhancement program in Bangladesh merits consideration. Priority investment areas for strengthening the safety net system are listed below.

*Improve the targeting performance.* Taking mistargeting and leakage into account, the safety net programs cover only a fraction of the poor. To address the irreconcilable chasm between the resources available for targeted interventions and the large needy population, safety net programs must improve their targeting effectiveness to reach the poorest of the poor. The targeting errors of exclusion and inclusion are large. The most disturbing fact is that the majority of rural households—poor and nonpoor—meet the official selection criteria for programs. These criteria, therefore, provide the scope for exercising perverse discretion in the beneficiary selection process. This suggests that the official targeting criteria must be improved for better identification of the poorest households. A two-step targeting mechanism can be used for most safety net programs. First, more resources should be targeted to those geographical areas where the prevalence of the specific problem a program intends

to address (such as serious food insecurity, malnutrition, school dropouts) and the incidence of poverty are high. That is, resource allocation should be proportional to the intensity of problems. Second, within geographic areas, a well-formulated proxy means testing method—which relies on indicators that are highly correlated with income, yet are easy to collect, observe, and verify—could be used to identify the needy. Proxy means test scoring has been used successfully for targeted interventions in many Latin American countries. When selection is done only on the basis of vulnerability or poverty maps, some extreme poor in relatively non-poor regions will not be included. Increased use of community input into beneficiary selection can improve targeting.

*Increase program coverage.* There are serious gaps in program coverage, with some of the most vulnerable groups not being assisted at all or being insufficiently covered (such as the urban poor, the elderly, and children). Urban slums, in particular, are promising areas for expansion. Sanitation, school dropout rates, health, and hygiene are key concerns in urban slums.

*Ensure sustainability of program benefits.* Transfer payments help the poor in the short term, but do not by themselves trigger sustainable income growth for the ultra poor. Most of the programs seem to be providing temporary poverty-alleviation impacts. Increasing the size of transfers as well as strengthening access to microcredit and savings services is critical to achieving sustainable improvements in the food security and livelihoods of the ultra poor. Research has shown that asset transfers by BRAC's Targeted Ultra Poor program lead to sustained food security and livelihood improvements. Similar asset transfer programs include the *Char* Livelihoods Project, SHOUHARDO, and *Jibon-O-Jibika*. However, such multisectoral safety net programs are much more costly than other safety net programs; therefore, the apparent trade-off between program coverage and sustainability needs to be carefully addressed. Given the encouraging results, these programs can be scaled up in economically lagging and disaster-prone regions.

*Scale up effective programs.* Evidently, the school feeding program offers significant short- and long-term benefits. Therefore, this program is a good candidate for expansion in both rural and urban areas.

*Integrate investments in human capital creation into safety nets through targeted education, health, and nutrition interventions.* Address the problems of dietary diversity of the poor.

*Use micronutrient-fortified *atta* (whole-wheat flour) in food-based safety nets.* Among the different forms of transfer, *atta* transfers do the most to improve the food security of the extreme poor, and of women in these ultra-poor households. *Atta* is also technically better suited for micronutrient fortification than rice or wheat. The current system of milling and fortification and distribution of micronutrient-fortified *atta* in sealed bags preserves the micronutrients, ensures the weight, maintains quality standards, and

prevents pilferage or leakage. Shifting from rice to *atta*, however, raises operational issues. Bangladesh's food policy operations are carried out through the Public Food Distribution System (PFDS), which operates through 15 distribution channels that broadly fall into two groups: monetized (sale) and nonmonetized channels. The latter are composed of the food-based safety net programs, accounting for about three-fourths of the total PFDS distribution, with rice accounting for about 70 percent of total nonmonetized distribution. Although a switch from rice to *atta* distribution in the transfer programs is possible, it will involve a major reshuffling of PFDS operations. This factor will also need to be considered if there is a significant shift from food to cash transfers, because such a shift would reduce or eliminate existing nonmonetized PFDS channels.

*Consolidate and simplify programs and phase out high-cost, ineffective programs.* There are numerous safety net programs currently operating in the Bangladesh. However, most of these programs have limited coverage, are uncoordinated, and are not adequately funded. Moreover, many programs are short lived and may cease implementation before achieving impact.

*Explore promising new programs and the use of suitable technology.* One intermediate option between food and cash transfers is to introduce a food-stamp or food-coupon program to transfer income to the needy. A part of PFDS stocks can be used for such a system. Food stamps or cash vouchers can be distributed to eligible consumers. The major advantage of such programs is that they use the normal marketing system, thus eliminating some administrative burdens. A food-stamp or a cash-voucher program is a viable option for transferring income to the poor, but it needs to be carefully piloted and evaluated before large-scale adoption. The feasibility of introducing new technology, such as the use of electronic ATM or Smart cards for cash payments that will enable beneficiaries to easily withdraw payments and check balances, should be explored. Such technology has the potential to greatly facilitate timely payment disbursements to program participants and to reduce leakage. For example, ATM technology has made cash transfers quite effective in Malawi and Kenya. Bangladesh's new digital national voter data could be used for the administration of cash transfers through Smart cards.

*Monitor and evaluate programs.* All safety net programs must have a built-in mechanism for monitoring and independent evaluation. A certain percentage of program funds can be earmarked for such evaluation, which will ensure timely learning, prompt remedial actions, and minimal waste. The information system of the Ministry of Food and Disaster Management needs to be strengthened.

*Move beyond coping approaches (safety nets) to risk-reduction approaches (social protection).* Formal safety net interventions belong to the broader social protection system. Social protection programs and policies support people who suffer from a chronic incapacity to secure basic subsistence. Such interventions can contribute to long-term poverty reduction and growth

through investments in the human capital of both children and adults—particularly their nutritional status, health, education, and skills. Social protection will become even more important in Bangladesh as the country faces economic downturn, food-price fluctuations, climate change, and other developments that increase the vulnerability of the poor.

## PUBLIC FOOD DISTRIBUTION

### Background

As with most other developing countries, public intervention in the foodgrain market in Bangladesh has been quite pervasive. The government procures foodgrains from domestic market, imports from abroad, distributes the imported and domestically procured foodgrains through different monetized and nonmonetized channels of the Public Food Distribution System (PFDS), sets procurement and distribution prices, strives to maintain floor and ceiling prices in order to stabilize seasonal price fluctuation, and regulates private trade. In the process, the incentive structure in the foodgrain market is altered. An important question is whether undesirable changes in incentives can be minimized through improved and more efficient operation of both the public and private food markets.

The remarkable changes in agriculture and the food economy that have occurred since independence, especially during the past two decades, have lessened the need for direct government intervention in the market to stabilize prices. Increased domestic foodgrain production, lower real prices of rice, better-integrated and more efficient foodgrain markets, reduced seasonal price variations (due largely to a sharp increase in *boro* rice production) and trade liberalization in the early 1990s have combined to reduce variability in supply and prices.<sup>3</sup> Nevertheless, the government must provide emergency relief during periods of natural disasters, alleviate chronic food insecurity through targeted food distribution to poor households, and take steps, when necessary, to stabilize market prices.<sup>4</sup> To accomplish these tasks, adequate public stocks are needed, for emergencies as well as for regular distribution.

The size and composition of PFDS has changed significantly during the past two decades (see Table 3). The annual volume of foodgrains distribution under PFDS declined from 2.3 million metric tons (mt) in the early 1990s to about 1.4 million mt in the

<sup>3</sup> However, the recent escalation in food prices has demonstrated that a liberalized trade regime cannot guarantee stable supplies and prices. In fact, the international market can no longer be relied on as a source of foodgrains when there is a shortage in the domestic market. A shift in strategy from self reliance to self sufficiency in food has thus become imperative for a food-importing country like Bangladesh.

<sup>4</sup> It may be emphasized here that the government's role in food security is not limited to price stabilization and public food distribution, but includes other policies, programs, and interventions affecting the availability, access, and utilization of food. These policies, programs, and interventions will be addressed in this and other papers presented at the Forum.

**Table 3—Public foodgrain distribution in Bangladesh (annual average, '000 metric tons)**

Program	1989/90-1991/92	1992/93-1996/97	2001/02-2005/06
<b>Sales Channels</b>			
Statutory rationing (SR)	187	11	0
Rural rationing (RR)	376	0	0
Essential program (EP)	145	172	231
Other priorities (OP)	232	11	18
Large Employees Industries (LEI)	45	17	11
Open Market Sales (OMS)	137	200	152
Fair price cards	0	0	10
Flour mills	235	39	49
Palli Chaka (rural mills)	96	21	7
Other/auction	0.0	7	0
<b>Sub-total</b>	<b>1,456</b>	<b>482</b>	<b>478</b>
	<b>(63%)</b>	<b>(33%)</b>	<b>(34%)</b>
<b>Non-sales Channels</b>			
Food-for-Work (FFW)	471	444	302
Test Relief (TR)	153	101	132
Vulnerable Group Development (VGD)	214	167	194
Gratuitous Relief (GR)	0	30	42
Food for Education (FEE)	0	154	40
Vulnerable Group Feeding (VGF)	0	0	111
Other	0	64	88
<b>Sub-total</b>	<b>838</b>	<b>961</b>	<b>909</b>
	<b>(37%)</b>	<b>(67%)</b>	<b>(66%)</b>
<b>Total</b>	<b>2,294</b>	<b>1,443</b>	<b>1,387</b>
	<b>(100%)</b>	<b>(100%)</b>	<b>(100%)</b>

Source: Dorosh, Shahabuddin, and Farid (2004), updated.

Note : Between 1989/90 and 1991/92, 63 percent of foodgrains were distributed through subsidized sales channels, with 40 per cent of this sold each year through the Rural Rationing and Urban Statutory Rationing channels. Non-sales targeted channels including Food-for-Work (FFW), Test Relief (TR) and Vulnerable Group Development (VGD) accounted for the remaining 37 percent of total PFDS distribution.

first half of the current decade.<sup>5</sup> This has been accompanied by a perceptible shift in the composition (sales vs. non-sales channels) of foodgrains distributed.

However, Rural Rationing and Urban Statutory channels were abolished in the early 1990s, in order to improve the targeting of foodgrains and reduce leakages and operational costs. Other sales programs, including OMS, were also cut back as the private sector came to play an increasingly prominent role in stabilizing market supplies and price, especially in times of natural disasters (such as the floods of 1998). From 2001/02 to 2005/06, targeted programs have accounted for 66 percent of PFDS's total distribution while subsidized sales channels have accounted for

<sup>5</sup> The annual distribution of PFDS, however, has increased in recent years (for example, 2.1 million mt in 2008/09 due to enhanced distribution under non-sales channels, especially FFW and TR). The budgeted (projected) distribution for 2009/10 is 2.7 million mt.

34 percent. Most evidence suggests that the shift from sales to targeted programs significantly improved the overall efficiency of PFDS (Dorosh, Shahabuddin, and Farid 2004).

In Bangladesh, there are both yearly and seasonal fluctuations of foodgrain prices. Annual variations are generally caused by the incidence of natural disasters (such as floods, cyclones, and droughts) and are moderated through private and public imports of foodgrains, mainly from other countries in the region. Seasonal variations in food prices are caused by the seasonality of rice harvests, especially harvests undertaken during the *aman* and rice seasons. The two policy instruments that the government uses to keep seasonal price fluctuations within acceptable limits are: (a) the domestic procurement program, whereby the government purchases grain from the market in order to maintain a floor price for farmers (below which market price would not fall)<sup>6</sup>, and (b) the open market sales (OMS) program to prevent prices from rising too high for consumers. The domestic procurement program has existed since the late 1970s, while the OMS program was introduced in the early 1980s. Both these programs involve substantial costs to the national budget. It is thus important that the underlying causes and implications of price fluctuations are properly understood before such costly programs are designed and implemented.

## Key issues and challenges

### Domestic Procurement Program

Since the early 1990s, private-sector grain imports have effectively made up any shortfall following poor rice harvests, without a substantial rise in prices (except in the 2007–2008 period). However, the country has trouble exporting rice when there are surpluses. On a number of occasions in the past decade, rice prices in Bangladesh fell below those in neighboring countries after good harvests, but this did not trigger exports because market links were not established and there is no internationally recognized system in place for grading Bangladeshi rice.

An alternative to exporting rice following bumper harvests is for the government to procure surpluses as a way of supporting domestic prices and providing incentive to farmers. However, setting a procurement price that sends adequate production signals to the farmers while minimizing costs to the public exchequer is a real challenge. Research indicates that it is easier to forecast the size of irrigated *boro* rice harvest and future prices than of *aman*, which is grown during the monsoon. From 1987 to 1999, procurement of *boro* rice exceeded 80 percent of the target in 9 of the 13 years and failed to reach at least 60 percent of the target in only one year. *Aman* procurement, on the other hand, exceeded 80 percent of the target in only 2 of the 13 years

<sup>6</sup> This program was used earlier just to build Government stocks of foodgrain for distribution.

and averaged only 18 percent of the target in 8 out of 12 years (Dorosh, Shahabuddin, and Farid 2004).<sup>7</sup>

During the late 1990s, the procurement price set for the *boro* harvest was excessively high in 3 out of 4 years, resulting in extra costs to the government and windfall profits to those fortunate enough to sell at the procurement centers. Moreover, setting procurement prices substantially above market prices encouraged rent-seeking behavior and corruption among public officials involved in the public procurement system. Unsatisfactory performance of the domestic procurement program in the past has been due to (a) excessive public-sector imports, particularly in years where there were good harvests (and even in some flood years), which occupied warehouse space, severely restricting the ability to procure during the next harvest; and (b) the limited access of farmers to procurement centers so that they are obliged to sell to private traders at a lower price. Other limitations include: too few procurement centers to allow for comprehensive coverage of producing areas, limited government financial resources; institutional impediments to speedy purchases from and payments to small sellers; and collusion between traders and officials, enabling traders to capture the margins between market and procurement prices. A sizeable share of procurement is from large farmers and traders, not from small and medium farmers (Shahabuddin and Islam 1999). To increase the participation of farmers (especially small and medium farmers) in the public procurement program remains a big challenge for the government.

### Public Stock Management

PFDS maintains food stocks in order to: (a) provide emergency relief during periods of natural disasters, (b) alleviate chronic food insecurity through targeted food distribution to poor households and (c) take steps, when necessary, to stabilize the market price of food, especially rice. The costs of procuring, storing, managing, and distributing large stocks of foodgrain are high. So it is important that the government does not hold more food than it needs for an adequate national food reserve.<sup>8</sup>

Since rice cannot be stored for more than six months without deteriorating, stocks typically have to be rolled over twice a year. Wheat, which was traditionally provided by food-aid donors, can be stored longer. A reduction in wheat-based food aid in recent years has increased the amount of rice in storage and thus the need to roll over the stock. Although this raised the cost of managing the food stock, this has been offset since 2002 by a fall in the overall size of the public stock. This can be attributed to the increased use of imports (rather than domestic procurement) to

<sup>7</sup> The picture remains more or less the same in recent years. During the 2000–09 period, procurement of *boro* rice exceeded 80 percent of the target in 8 of the 10 years and failed to reach at least 60 percent of the target in only one year (2007). *Aman* procurement, on the other hand, exceeded 80 percent of the target in only 2 of the 10 years.

<sup>8</sup> The National Food Policy of 2006 recommended maintaining a public stock of 1.0 million mt of foodgrains. However, the official government target in late 2008 was to hold a stock of 1.5 million mt of rice and wheat.

stabilize prices during a period of relatively stable international prices.

It may be emphasized here that public stocks are not a cost-effective instrument by which to increase the food supply. Grain reserves are costly to maintain and divert public expenditure from other investments aimed at increased agricultural production (for example, rural infrastructure and/or improved technology). Determining the minimum level of grain reserve is, therefore, very important (World Bank 2008b). Moreover, it is important to note that the same amount of grain cannot simultaneously serve the three objectives of providing an adequate safety net for the poor, stabilizing market prices, and providing emergency relief. There are inevitable trade-offs between the three objectives. For example, a sudden emergency may require stocks to be drawn so low that normal distribution of grain is no longer feasible and must be postponed or even cancelled or targeted to those most in need. Thus, acceptable stock levels need to be analyzed for each purpose, together with a review of alternative instruments available outside the PFDS (Shahabuddin et al. 2009).

PFDS stock levels have changed over time, along with the overall size of the PFDS and major distribution channels. In the late 1980s and early 1990s, PFDS's total annual distribution ranged from 2.16 to 2.97 million mt, with most of the foodgrains distributed through ration channels, as mentioned earlier. Stock levels in 1989/90 and 1990/91 averaged 1.14 million mt, equal to 6.7 and 5.4 times the monthly average distribution in those years, respectively. Major reforms in the PFDS took place in the early 1990s, including the elimination of major rationing channels (Statutory Rationing and Rural Rationing) and placing greater emphasis on targeted distribution. Total distribution was reduced to an average of 1.53 million mt from 1993/94 through 1996/97. Stock levels were reduced as well, with average annual stocks ranging from 0.57 million mt to 0.95 million mt over the period. Total foodgrain stocks increased rapidly after the 1998 floods, however, to an annual average of 1.35 million mt in 1999/2000 and 0.95 million mt in 2000/01 (Dorosh, Shahabuddin, and Farid 2004).<sup>9</sup> Since 2001/02, average stock have largely exhibited a declining trend, averaging 0.82 million mt from 2001/02 through 2008/09. Total foodgrain distribution averaged 1.43 million mt during this period.

Temporary export bans imposed by major grain-exporting countries in 2008 caused policymakers in Bangladesh to reassess the risks of relying on imports from other countries in times of extreme distress or crisis. It has been calculated in the past by the government that maintaining year-round grain stocks of between 0.7 and 1.5 million mt is adequate for national food security. In addition to the security stock, the government estimated a need in 2008-09 of 1.9 million mt flowing through the PFDS for feeding

<sup>9</sup> This large PFDS stock build up occurred mainly because of delayed import arrivals and relatively high levels of domestic procurement in response to declining market prices immediately after the harvest of consecutive bumper crops (*boro* 1999, *aman* 1999/2000, *boro* 2000, and *aman* 2000/01).

into food-based safety net programs, with another 0.5 million mt for price-stabilization programs such as the OMS.

Although public warehouses have the capacity to store 1.7 million mt, some of the space is unusable, reducing the effective government storage capacity to 1.5 million mt. This is adequate for minimum national security stock, but not for the additional stock to stabilize prices and continue with the food-based safety net programs. In view of this, pending the construction of new public warehouses, the government may consider using private storage as well. Therefore, an assessment is needed of existing private storage capacity and the willingness of private traders to lease warehouses to government and/or hold temporary stocks on behalf of the government.<sup>10</sup>

### *Reducing storage and transit losses: Suggested approach*

- **Technological Approach:** includes (a) modernizing the storage and handling system and constructing multigrain silos in strategic places, (b) controlling the storage environment for temperature, humidity, etc., (c) using food-fit vehicles for transportation, (d) using modern weighing equipment, (e) using information technology down to the local supply depot (LSD) level: for example, to readily estimate stock in warehouses and stock in transit at a certain point in time; implementing a GIS-based commodity movement/tracking system.
- **Management Approach:** includes (a) raising the management efficiency of officials and staff through training, (b) minimizing the frequency of movement of foodgrains, (c) setting the optimum storage life and maintaining and replenishing the stock, (d) planning food aid arrivals so as not to coincide with the government's domestic procurement seasons, and (e) allocating funds locally for food transport, management, and distribution.
- **Institutional Approach:** includes (a) determining storage and transit loss based on scientific analysis, reducing the allowable limits (note that silos do not have any allowable limit for storage and transit loss, but other flat warehouses do have and they misuse the limit), (b) establishing a unit for operation research in the directorate to assist in movement planning, storage planning, and other planning activities, (c) strengthening the training directorate so that it can provide training on food management, storage management, food technology, engineering management, and food quality, and (d) addressing the issues of corruption and malpractices.

<sup>10</sup> This should take into account the high demands on scarce human resources in the public sector, especially in the line departments, for management of public stock. A policy of expanding public grain stock thus needs to pay adequate attention to institutional considerations.

## Areas of intervention and investment options

The National Food Policy 2006 (NFP) Plan of Action (2008-2015) may serve as a basis for identifying and prioritizing the options for investment and interventions for achieving food security in Bangladesh. The NFP provides strategic guidance for addressing the key challenges Bangladesh faces in achieving food security in all its dimensions, including food supply and availability; physical, social, and economic access to food; and nutrition/utilization of food as embedded in these three core objectives. The Plan of Action translates the provisions of the NFP into 26 strategic areas of intervention; determines priority actions to be undertaken in the short, medium, and long term; identifies responsible actors (government and non-government); and suggests a set of policy targets and indicators for monitoring progress. In fact, the Plan is expected to be the guiding document for coordinating the implementation and monitoring of the NFP by all responsible ministries and agencies.

It has become imperative to enhance the effectiveness of the public procurement system, which is an integral part of the public food management system with its dual role of stabilizing prices, especially providing effective support to prices received by farmers during post-harvest seasons. The food crisis of 2007/08 strengthened the case for improving the effectiveness of the domestic procurement program. Recent developments include the 2009/10 budget announcement, which mentioned the creation of an integrated program consisting of food procurement, storage, and distribution, with a substantial expansion of the public storage capacity of foodgrains. Steps have also been taken to procure paddy directly from the farmers and ensure transparency in the procurement process, with a view to enhancing the benefits to farmers for maintaining production incentives (NFP 2009).

Further areas of public intervention include, among others: (a) proper fixing and appropriate timing of announcement of procurement prices so that these send correct signals to producers while minimizing budgetary costs to the government, and (b) identifying suitable institutional mechanism for procurement of paddy directly from farmers. In this context, the specific recommendations of the Plan of Action deserve serious consideration. In the short and medium term, the Plan recommends improving the methodology for determining the prices and quantity of procurement, including estimation of production costs and production targets. To this end, the Plan of Action also underscores the effective development and implementation of an early warning information system. The Plan also argues for more transparent procurement rules and decisions, and recommends undertaking impact studies to assess the effectiveness of the procurement administration. At the operational level, the Plan of Action recommends increasing purchases through open, competitive tenders.

Proper management of public stock is essential for the improved effectiveness of the Public Food Distribution System (PFDS). The government has to maintain rolling stocks to cater to the routine needs of the PFDS, including safety net programs and open market sales (OMS), as well as minimum buffer stocks for

emergency distribution in times of natural disasters.<sup>11</sup> This calls for careful planning and management of the amount of grains to be stocked and distributed, and for the establishment of storage facilities and the improved monitoring of existing storage quality.

No attempt has been made here to estimate the optimal foodgrain stock. This would involve a rigorous analysis of PFDS costs and benefits and alternative PFDS stock options, which is beyond the scope of this work. However, because the government currently has no mechanism to rotate stocks apart from PFDS distribution, the level of stocks is closely related to the size of the PFDS.<sup>12</sup>

It should be noted that the building up of foodgrain stock is contingent upon the government's capacity to procure grains either from domestic production and/or from external sources (food aid and commercial imports). Total effective storage capacity is also an important determinant of maintaining the amount of annual stock of grains in the country.<sup>13</sup> One important indicator of efficient stock management would be a good balance between actual stock of foodgrain and a carefully estimated budgetary target of stock at a specific point in time. However, the target itself may require revision because of unforeseen events such as natural disasters, which may require an upward revision of the target. Sometimes higher or lower levels of stocks resulting from higher or lower levels of procurement are not matched by proper distribution through different PFDS channels.

Although the potential storage capacity of foodgrains is estimated to be about 1.7 million mt, effective storage capacity is estimated at 1.4 mt. This gap of 0.3 mt of potential capacity can be converted into effective/actual capacity by repairing and renovating some of the unused warehouses in the country. Efforts are under way to construct additional warehouses in the country, while unused warehouses are being repaired. According to a recent government decision, an additional storage of 0.58 million mt of foodgrains will be constructed by 2012. For the medium and long term, the government has undertaken projects to enhance public storage capacity from 1.5 million mt to 2.2 million mt during the next 3-5 years and is planning to increase the storage capacity to about 3.0 million mt by 2020. Moreover, the government is also working to renovating dilapidated storage facilities and demolish unused ones (about 0.2 million mt).

<sup>11</sup> While estimating the minimum buffer stocks for emergency distribution, due consideration should be given to the climate-change induced greater intensity and frequency of natural disasters, as well as to growth in population (the population may increase by 100 million by 2050 unless the rate can be significantly lowered), which poses a major challenge for Bangladesh.

<sup>12</sup> It may be mentioned here that building up higher levels of stocks without a mechanism by which to rotate the stocks may result in serious quality deterioration as the average age of the stocks increases. The direct costs of increased distribution are clearly shown in government accounts. However, the costs to consumers of quality deterioration of PFDS foodgrain are not accounted for. Closer attention must be paid to the quality of foodgrain in storage and the link between the size of the stock and the amount of distribution needed to rotate stocks (Dorosh, Shahabuddin, and Farid 2004).

<sup>13</sup> There is an obvious interface between the two since expansion of storage capacity also depends on the amount of "optimum/desirable" public stock with due allowances for unutilized space, unusable space, seasonal peaks, and shifts in PFDS distribution, for example.

Among various interventions, the following areas as identified in the NFP Plan of Action Draft Monitoring Report 2009 for further action should receive special/priority attention:

- *Speeding up the computerization of the food stock/storage monitoring system nationwide:* The effectiveness of the monitoring system of public stocks (inflows, outflows, stock in transit, and storage and transport losses) affects the efficiency of the storage and distribution system. In this context, upgrading storage and stock-relevant data collection and processing infrastructure, and improving the management of information flows within the PFDS through greater reliance on information and communication technologies (ICT) should be a priority. This requires scaling up the pilot initiative undertaken by the Directorate General (DG) of Food with the assistance of the Asian Development Bank (ADB).<sup>14</sup>
- *Undertaking proper management of public storage expansion and exploring opportunities for public–private partnerships in food storage capacity expansion:* The government plans to increase “buffer stocks” (for both emergency distribution and price stabilization) and scale up food distribution under safety net programs, which would require an expansion of foodgrain storage capacities. Adequate storage facilities would also need to be built for other essential commodities, alongside the establishment of appropriate distribution channels, to accommodate the government’s plans to import and distribute non-foodgrain essential food items. While not foreseen under the government’s current public–private partnership (PPP) approach, this underscores exploring PPP opportunities in storage capacity development. This would require a thorough assessment of private storage capacity and the willingness of private traders/millers to enter into leasing agreements with the government.<sup>15</sup>
- *Conducting research on public stock management:* As mentioned earlier, the determination of the “desirable” stock level (both at the aggregate level and in different locations) remains an important concern, keeping in mind that public stocks have to serve multiple purposes and that there are important constraints arising from the need to rotate foodgrain stocks. Among other issues, the potential trade-offs between the different uses of public

stocks for regular distribution, emergency distribution, and consumer price reduction/stabilization would need to be further analyzed (Shahabuddin et al. 2009). Also, because PFDS is costly, the possibilities for balancing distribution through priced and non-priced channels should be further explored.

- *Providing continued budget support to the development of an effective early warning information system:* This is needed for more effective public stock management, support to poor consumers through OMS, more effective procurement programs, and improved Food Planning and Monitoring Unit (FPMU) of the Ministry of Food and Disaster Management.
- *Ensuring sustained capacity development of PFDS officials through local as well as foreign training:* This is required for enhancement of management efficiency for reducing storage and transit losses and the improved effectiveness of domestic procurement programs and PFDS distribution through better designing and implementation of targeted programs.

On the whole, the priority interventions and supporting investments for strengthening the PFDS should include, among others: (1) increased storage capacity to offer more price support to farmers and to cater to an increased need for food-based safety nets ; (2) modern storage to reduce cost of storage and handling, improve moisture control, and increase shelf life, and reduce storage loss; (3) improved management efficiency by planned and continuous local and foreign training for officials; (4) adoption of information technologies to improve monitoring; (5) computerization from the national level down to local supply depots to speed up the processing and communication of information; (6) operation research for optimization of stock level, sound movement planning, and commodity tracking in transit; (7) sound food information database and its management to expedite decisionmaking processes; (8) sound food quality control infrastructure: trained staff, laboratories down to the sub-national level, and standard methods and equipments/instruments for testing and certification etc; (9) special provision within the PFDS framework for the likely huge number of people who will become food insecure as a result of climate change, especially in flood plains and coastal areas; and (10) further development of early warning information system.

## CONCLUSION

In Bangladesh, substantial increases in rice production in the past two decades have, to a large extent, solved the foodgrain availability problem. Now, the food security dialogue in the country must increasingly focus on the other two components of food security—access to food through increased income of the poor, and food utilization and nutrition.

<sup>14</sup> Pilot initiatives are under way at the level of DG Food to computerize and network food stock/storage monitoring, under the ADB-supported project on Strengthening the Government Institutional Capacity for Improved Food Security.

<sup>15</sup> A review of international experience (India, and Pakistan) with public–private partnerships in the area of bulk handling, storage transportation, and quality control [such as Build-Own-Operate Transfers (BOOT); Build-Own-Lease Transfers (BOLT); Build-Own-Operate (BOO); and Lease-Develop-Operate (LDO)] as well as regulations and modalities for contracting out private companies/agencies in procurement areas, and assessing the feasibility of their replication in the Bangladesh context would also be useful.

Poverty and food insecurity are interlinked. The overall incidence of poverty persists at a high level in Bangladesh. The poor do not have adequate purchasing power to secure their access to food, even when food is available in local markets. For this reason, sustainable poverty reduction requires broad-based, employment-generating economic growth. It also requires the development of human capital to empower the poor so that they can participate in the growth process. Economic growth, however, is not sufficient to improve human capital and reduce poverty. Thus, strengthened safety nets and social protection systems are an essential component of the solution for many of the country's poor.

## REFERENCES

- Ahmed, A. U. 1992. *Operational performance of the rural rationing program in Bangladesh*. Working Paper on Bangladesh No. 5. Washington, D.C.: International Food Policy Research Institute.
- \_\_\_\_\_. 1993. *Food consumption and nutritional effects of targeted food interventions in Bangladesh*. Bangladesh Food Policy Project Manuscript 31. Washington, D.C.: International Food Policy Research Institute.
- \_\_\_\_\_. 2000. Targeted distribution. In *Out of the shadow of famine: Evolving food markets and food policy in Bangladesh*, ed. R. Ahmed, S. Haggblade, and T. E. Chowdhury. Baltimore: Johns Hopkins University Press for the International Food Policy Research Institute.
- \_\_\_\_\_. 2004a. *Impacts of feeding children in school: Evidence from Bangladesh*. A study commissioned by the United Nations University. Washington, D.C.: International Food Policy Research Institute.
- \_\_\_\_\_. 2004b. Assessing the performance of conditional cash transfer programs for girls and boys in primary and secondary schools in Bangladesh. Project report prepared for the World Bank. Washington, D.C.: International Food Policy Research Institute.
- \_\_\_\_\_. 2004c. "Targeting effectiveness of the vulnerable group development program in Bangladesh." Project report prepared for the U.N. World Food Programme. Washington, D.C.: International Food Policy Research Institute.
- \_\_\_\_\_. 2005a. Food and nutrition security in Bangladesh: What role for safety nets? Paper prepared for the seminar "Food Policy in Bangladesh: Issues and Perspectives," jointly sponsored by International Food Policy Research Institute, the Bangladesh Institute of Development Studies, and the Bangladesh Rice Foundation. Dhaka, March 13.
- \_\_\_\_\_. 2005b. *Comparing food and cash incentives for schooling in Bangladesh*. A study commissioned by the United Nations University. Washington, D.C.: International Food Policy Research Institute.
- \_\_\_\_\_. 2006. Evaluating the "Reaching Out-of-School Children Project in Bangladesh": A baseline study. Project report prepared for the World Bank. Washington, D.C.: International Food Policy Research Institute.
- Ahmed, A. U., and H. Bouis. 2002. Weighing what's practical: Proxy means testing for targeting food subsidies in Egypt. *Food Policy* 27 (5-6): 519-540.
- Ahmed, A. U., and C. del Ninno. 2005. Feeding minds while fighting poverty: Food for education in Bangladesh. In *Economic reforms and food security: The impact of trade and technology in South Asia.*, ed. S. Babu and A. Gulati. New York: The Haworth Press.
- Ahmed, A. U., A. Quisumbing, J. Hoddinott, M. Nasreen, and E. Bryan. 2009. *Comparing food and cash transfers to the ultra-poor in Bangladesh*. Research Monograph 163. Washington, D.C.: International Food Policy Research Institute.
- Ahmed, S. S. 2005. *Delivery mechanisms of cash transfer programs to the poor in Bangladesh*. Social Protection Discussion Paper No. 520. Washington, D.C.: World Bank.
- Ali, A. M. M. S. 2009. *Strengthening the government's institutional capacity for improving food security*. Report prepared for the Asian Development Bank. Dhaka, Bangladesh: Asian Development Bank.
- Arndt, C., P. Dorosh, M. Fontana, and S. Zohir, with M. El-Said and C. Lungren. 2002. *Opportunities and challenges in agriculture and garments: A general equilibrium analysis of the Bangladesh economy*. Trade and Macroeconomics Division Discussion Paper No. 107. Washington, D.C.: International Food Policy Research Institute.
- BBS (Bangladesh Bureau of Statistics). 2006. *Preliminary Report on Household Income and Expenditure Survey – 2005*. Dhaka, Bangladesh: Ministry of Planning, Government of the People's Republic of Bangladesh.
- Chowdhury, S., and M. Torero. 2006. *Urban rural linkages in Bangladesh: Impact of infrastructure and the food value chain on livelihoods and migration of landless households, women in the Northwestern region*. IFPRI Discussion paper. Washington, D.C.: International Food Policy Research Institute.
- Dorosh, P. 2006. *Accelerating income growth in rural Bangladesh*. World Bank South Asia Agricultural and Rural Development Unit. Washington, D.C.: World Bank.
- Dorosh, P., Q. Shahabuddin, and M. S. Rahman. 2002. Price responsiveness of foodgrain supply in Bangladesh and projections to 2020. *Bangladesh Development Studies* 28 (1 and 2).

- Dorosh, P., Q. Shahabuddin, and N. Farid. 2004. Price stabilization and food stock policy. In *The 1998 floods and beyond: Towards comprehensive food security in Bangladesh*, ed. P. Dorosh et al. Dhaka, Bangladesh and Washington, D.C.: The University Press Limited and the International Food Policy Research Institute.
- FPMU (Food Planning and Monitoring Unit). 2008. *National food policy: Plan of action (2008-2015)*. Dhaka, Bangladesh: Ministry of Food and Disaster Management, Government of the People's Republic of Bangladesh.
- \_\_\_\_\_. *National food policy: Plan of action (2008-2015), Monitoring report 2009*. Dhaka, Bangladesh: Ministry of Food and Disaster Management, Government of the People's Republic of Bangladesh.
- Haggblade, S., P.B.R. Hazell, and T. Reardon, eds. 2007. *Transforming the rural nonfarm economy: Opportunities and threats in the developing world*. Baltimore, MD: Johns Hopkins University Press for the International Food Policy Research Institute.
- Mellor, J.W. 1976. *The new economics of growth*. Ithaca, New York: Cornell University Press.
- \_\_\_\_\_. 1992. *Agriculture on the Road to Industrialization*. Baltimore, Maryland: Johns Hopkins University Press.
- NFP (National Food Policy 2009). *Plan of Action Draft Monitoring Report*. Dhaka, Bangladesh: Ministry of Food and Disaster Management, Government of the People's Republic of Bangladesh.
- Planning Commission. 2009. *Steps towards change: National strategy for accelerated poverty reduction-II*. Revised FY 2009-II. Dhaka, Bangladesh: Ministry of Planning, Government of the People's Republic of Bangladesh.
- Shahabuddin, Q., and K.M.N. Islam. 1999. *Domestic rice procurement programme in Bangladesh: An evaluation*. Food Management Research Support Project Working Paper No. 8. Washington, D.C. and Dhaka: International Food Policy Research Institute and Food Management Research Support Project.
- Shahabuddin, Q., M. Asaduzzaman, E. Clay, and S. Jones. 2009. *Price support, domestic procurement programme, and public stock management*. Bangladesh Institute of Development Studies Policy Brief No. 2. Dhaka, Bangladesh: Bangladesh Institute of Development Studies.
- WGTFI (Working Group on Targeted Food Interventions). 1994. *Options for targeting food interventions in Bangladesh*. IFPRI Working Paper drafted by S. Haggblade and A. Ahmed. Washington, D.C.: International Food Policy Research Institute.
- World Bank. 2004. *Promoting the rural non-farm sector in Bangladesh*. Report No. 29719-BD. Washington, D.C.
- \_\_\_\_\_. 2005. *Social safety nets in Bangladesh: An assessment*. Report No. 33411-BD. Washington, D.C.
- \_\_\_\_\_. 2007. *High value agriculture in Bangladesh: An assessment of agro-business opportunities and constraints*. Washington, D.C.
- \_\_\_\_\_. 2008a. *World Development Report*. Washington, D.C.
- \_\_\_\_\_. 2008b. *Bangladesh: Agriculture and food policy note*. Prepared by H. Jansen and N. Fernando. Washington, D.C.



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