

SPECIAL REPORT

FAO/WFP CROP AND FOOD SUPPLY ASSESSMENT MISSION TO BANGLADESH

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WORLD FOOD PROGRAMME, ROME

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Abbreviations and Acronyms

ACI	Advanced Chemical Industry
ADB	Asian Development Bank
BBS	Bangladesh Bureau of Statistics
BCIC	Bangladesh Chemical Industries Corporation
BDR	Bangladesh Rifles
BDT	Bangladesh Taka
BLS	Bacterial Leaf Streak
BRAC	Building Resources Across Communities (Largest NGO of the country)
BRRRI	Bangladesh Rice Research Institute
DAE	Department of Agricultural Extension
DAM	Department of Agriculture Marketing
DTW	Deep Tube Well
CFW	Cash-for-Work
EAL	Emergency Assistance Loan
ECHO	European Community Humanitarian Organization
EMOP	Emergency Operation (WFP)
FAO	Food and Agriculture Organization of the United Nations
FFE	Food for Education
FFW	Food-for-Work
FGD	Focused Group Discussion
HYV	High Yielding Variety
IMF	International Monetary Fund
JBIC	Japan Bank for International Cooperation
LLP	Low Lift Pump
MISM	Management Information System and Monitoring
MOP	Muriate of potash (Potash containing fertilizer)
NFP	National Food Policy
OMS	Open Market Sales
PFDS	Public Food Distribution System
SAAO	Sub Assistant Agriculture Officer working at grass root level
SAARC	South Asian Association for Regional Cooperation
SCF-US	Save the Children Fund - United States
SSN	Social Safety Nets
STW	Shallow Tube Well
TANGO	Technical Assistance to Non-Governmental Organizations
TSP	Triple Super Phosphate (Phosphorus containing fertilizer)
VGF	Vulnerable Group Feeding
USAID	United States Aid for International Development
WFP	World Food Programme of the United Nations

Mission Highlights

- The Mission assessed the 2008 Boro rice production, which was being harvested in many parts of the country in April and May and wheat production, which was harvested in March. The Boro rice output is estimated at 17.54 million tonnes, increased by some 17.2 percent from the previous year and 29.3 percent above the five-year average.
- This increase of production was mainly due to favourable weather conditions and extra efforts made by farmers and Government in response to the high rice prices and production loss of 1.4 million tonnes in 2007 Aman season following severe flooding and Cyclone Sidr.
- Total cereal output in the 2007/08 marketing year (November/October), including 2007 Aman, 2008 Boro and Aus seasons, is estimated at 28.85 million tonnes, 5.6 percent above the previous year. Total cereal (rice and wheat) import requirement in the 2007/08 is estimated at about 3.07 million tonnes, of which 2.57 million tonnes are expected to be imported commercially. Food aid received or committed is estimated at 155 000 tonnes.
- Though good production of Boro season is achieved nationally, this Boro production does not fully compensate for the heavy losses some farmers suffered in the previous Aman season in the south and east of the country. The total annual rice output of the 10 worst cyclone-affected districts in 2007/08 is expected to be about 2 million tonnes, 276 000 tonnes or 12 percent below the two-year average of those districts. Agriculture assistance, including seeds, fertilizer, tools in those districts in the worst affected districts and the food aid/assistance programmes of WFP to more than 1.5 million vulnerable people will continue to be needed to the end of the year.
- The wholesale and retail prices of coarse rice, the nation's major food staple, have increased by 78 and 82 percent, respectively, from June 2006 to June 2008 based on the data from DAM and MISM.
- Rapid price rises of rice and other foods are putting intolerable pressure on poor urban and rural households, forcing them to lower consumption of protein and micronutrient rich foods and causing concerns about the risk of rising malnutrition rates. The Mission estimates that the increase in food prices has raised the number of the Absolute Poor by 7.5 million people, to a total of 65.3 million, and raised the prevalence of undernourishment to 45 percent.
- The Mission estimated the food security assistance needs of the country to be 1.45 Million tonnes, of which 35 000 tonnes are for vulnerable households affected by Cyclone Sidr. To meet this need, 410 000 tonnes will have to be imported, and 1.04 million tonnes locally purchased.
- Rice producer prices were set higher for the Boro season. 2008 wet paddy price at BDT 18-20/kg compared to BDT 10-12 last year; and milled rice prices varying from BDT 30-40 compared with BDT 15-16/kg last year. But due to sharecropping arrangements and lack of working capital which forces forward sales, many farmers did not get the full benefit of these price increases.
- The rapid increase in the planting of hybrid varieties played a part in raising overall yields and production, but much remains to be done. Shortages of fertilizers, particularly TSP and MOP at planting time, limited crop yields. It is absolutely essential, despite doubling or tripling of world fertilizer prices in 2008, that adequate quantities of all fertilizers are procured and distributed for the next cropping season.

1. OVERVIEW

Bangladesh suffered from widespread monsoon floods, followed by a severe cyclone resulting in the loss of an estimated 1.4 million tonnes of Aman rice in 2007. Food security of the country has been significantly and adversely affected by rising food prices. At the request of the Ministry of Agriculture of Bangladesh, a joint FAO/WFP Crop and Food Supply Assessment Mission visited the country from 14 April to 6 May 2008. The overall objective of the assessment was to estimate/forecast the 2008 Boro rice production and food production situation, assess the food supply and demand situation at national and sub-national levels, market access and impact of high food prices on food utilization in the country at national, sub-national and household levels so that appropriate actions can be taken by the Government and the international community to minimize the impact of potential food crisis/insecurity.

The Mission held meetings with relevant institutions, including Government, international agencies, donors, non-Governmental organizations (NGOs) and the private sector. The Mission reviewed the crop production data from Ministry of Agriculture (MoA) and Bangladesh Bureau of Statistics (BBS) and collected available data and information on food security from different sources. The Mission was divided into four groups and visited 37 of the country's 64 districts, located in all 10 development regions (see Table A1 and Map A1).

The Mission observed crop-growing conditions, examined the import supply situation and the area changes and yields under different categories and different regions. The Mission assessed the impact of the 2007 cyclone and floods on food production and availability in the worst-affected districts. Extensive interviews

were conducted with farmers, millers, local Government officers, agricultural research institutes, seed and fertilizer companies and local NGOs regarding short- and long-term food production and supply problems. In addition, telephone interviews were conducted with Government officials in districts that the Mission could not visit and information of local extension offices of MoA was also used for the analysis of rice and other foodcrop production in these districts.

Extensive interviews were also conducted with households in urban and rural areas to obtain information on the impact of high food prices on income, food expenditure and food consumption. The Mission visited customs points along the Indian border and interviewed officers, traders (grain, vegetables, livestock and farm inputs) in Dhaka and Chittagong and local markets, millers and farmers in the fields to obtain first-hand information regarding formal and informal trade in food and agricultural inputs.

Prior to its departure to rural Bangladesh, the Mission held debriefing sessions with Government authorities, UN agencies and other development partners in Dhaka and also debriefed FAORAP in Bangkok.

We would like to thank officials from the Ministry of Agriculture and the Ministry of Food and Disaster Management for their assistance to the Mission and the Bangladesh Bureau of Statistics for its data support. We are grateful to Mr. Ad Spijkers, the project staff in the food policy project and FAO Office colleagues in Dhaka for their strong support. We also gratefully acknowledge the considerable efforts provided by all the twelve national consultants coordinated by Mr. Badrul Arefin from the Ministry of Agriculture. The same is true for the support of many technicians, scientists and scholars as well as the efficient logistics provided by WFP colleagues.

The Mission estimates a national average Boro rice yield of 3.78 t/ha, an increase of 9.05 percent above the national yield for the previous year of 3.52 t/ha. Rice production is estimated at 17.539 million tonnes, approximately 17 percent above the previous year and 29 percent over the five-year average. Aggregate rice production in 2007/08 (including 2007 Aman, 2008 Boro and Aus) is forecast at 28.849 million tonnes, some 5.6 percent above those in the previous year and 12.4 percent above the five-year average.

This increase of production was mainly due to favourable weather conditions and extra efforts made by farmers and the Government in response to the high rice prices and production loss of 1.4 million tonnes in 2007 Aman season following severe flooding and Cyclone Sidr. Due to damage to transplanted Aman by floods during the last season, farmers planted more area of Boro and inputs received for rehabilitation were used on the Boro crop. The high price of rice in the local market also influenced farmers to cultivate each and every available plot for Boro rice. There was a positive change in some districts to the use of Hybrid Varieties. The main varieties used were BRRI Dhan 29 and BRRI Dhan 28.

There was a small overall increase in the number of irrigation pumps and in irrigation coverage. Three to four instances of intermittent rains also assisted in providing water to the crop. The Mission noted that water is being wasted in some areas due to seepage from earth canals. Pre-cast canals would save considerable amounts of water, but they require considerable investment. The weather was favourable (intermittent rainfall and strong sunshine) throughout the growing season. Though some complaints were received from farmers concerning the shortage of electricity, Government efforts to direct electricity supplies to irrigation were generally successful and this provided irrigation at lower cost to farmers.

This season had a long cool period and wheat yields in 2008 were much improved at 2.584 t/ha compared to 2.053 t/ha the previous year, resulting in production of 955 963 tonnes, an increase of 190 915 tonnes, or almost 25 percent above the previous year's harvest.

The area of land planted to maize has been increasing rapidly in recent years, from 121 962 ha in 2006 to 193 630 ha in 2007 to 342 614 ha in 2008. The crop can be grown throughout the year, but 95 percent is planted in the Rabi season from October to late-December. Production has also increased this year by 85.6 percent to 2 089 945 tonnes at a yield, estimated by the Mission, of 6.1 t/ha.

With total domestic rice and wheat availability and utilization assessed at 33.69 million tonnes and 37.26 million tonnes respectively, estimated required imports amount to 3.07 million tonnes. Taking into account the 2.57 million tonnes of commercial imports and the 155 000 tonnes of food aid received so far, there appears a gap of 345 000 tonnes that has to be filled somehow.

There appears to be a surplus of 469 000 tonnes of rice which will be used as a substitute for wheat imports. A similar exercise for wheat reveals a gap of 814 000 tonnes, bringing the deficit for both cereals to 345 000 tonnes after substituted 469 000 tonnes of rice surplus.

Concerning the cost of food items, the surge in rice prices in recent months has been the major cause for concern. Whole and retail prices of local coarse rice, the nation's major food staple, have increased by 78 and 82 percent respectively, from June 2007 to June 2008, with the fastest acceleration –38 percent (wholesale) and 36 percent (retail) - occurring between October 2007 and March 2008.

This increase in rice prices is attributable to both internal and external factors. At the domestic level, severe floods that swamped large tracts of agricultural land in August and September 2007, and particularly Cyclone Sidr that hit the country the on 15 November caused extensive devastation to crops. Rising costs of key inputs such as fertilizers have also fuelled the rice price hike.

The Bangladesh rice market has not been insulated from developments in the rice supply/demand situation in neighbouring countries or the world rice and food market at large. Owing to the devastation caused by Cyclone Nargis to large tracts of its rice land on 3 May, Myanmar will not this season be able to honour commitments to export some 600 000 tonnes of the staple food - part of which was destined for Bangladesh - adding to the expectations of a further tightening of supplies in the region and worldwide. The upward pressure on prices has been exacerbated by export restriction measures adopted recently by some major rice producers. The rice prices in Bangladesh have been significantly affected by India's minimum export prices of non-basmati rice since October 2007.

Rice is the staple food, contributing to over 63 percent of the caloric intake for urban consumers and over 71 percent for the rural population based on 2005 household survey data by BBS. The percentages are much higher for the poor. Food expenditures accounted for nearly 54 percent of total consumption expenditures, a share approaching 60 percent in rural areas. These data underscore the predicament not only of the 60 million Bangladeshi still struggling to climb out poverty, but of the millions more that soaring food prices are dragging below the poverty line. As the Mission observed, the hardest hit are fixed-income earners and rural households experiencing crop failure.

The consumer on a low-fixed income is bearing the brunt of price hikes. This indicates the need for expanded social safety nets to include those falling back into severe food insecurity and the poverty trap. Such programmes should be extended to villages that have suffered crop failure this season.

The prevalence of undernourishment in Bangladesh before the mid 2007 food price increase was already very high with approximately 27.9 million people estimated to have daily caloric intake less than 1805 kcal. This population is estimated to be approximately 34.7 million now, nearly 7 million higher, primarily as a result of rising food prices.

Bangladesh's food insecure population has become significantly larger, as a result of the rising food prices. The severity of food insecurity has also worsened. The average food consumption caloric "gap" has become larger, resulting in more severe deprivation. This is a major concern for food security going forward and presents a substantial challenge to Bangladesh's social safety net system and the large population which it serves.

The country's food insecure population is now estimated to be 65.3 million people; and has risen by 7.5 million largely because of the impact of higher food prices. Similarly, the size of the severely food insecure population has grown by an estimated 6.9 million; up from 27.9 million to a present level of 34.7 million. As a result, nearly half (45 percent) of the country's 145 million population is now food insecure (< 2122 kcals/person/day), and nearly one-quarter (23.9 percent) of the population is understood as severely food insecure (consuming less than 1 805 kcals/person/day).

Due to the rise in food prices and other basic essentials, the GoB has announced a significant expansion of food security oriented safety net programmes in 2008/09. This was highlighted by many high-level GoB officials, including the Finance Advisor, in public addresses associated with the launching of the new fiscal-year 2008-09 GoB budget. The Mission estimates that approximately 68 million individuals would receive support from the GoB food assistance safety net programmes; under the assumption that the plan will be implemented (i.e. targets will be reached); implying 37.5 million people more than the 30.5 million estimate associated with fiscal year 2007-08.

Estimating the total number of individuals receiving assistance, through non Government programmes that have an explicit emphasis on facilitating food access, is problematic due to the large number of organizations involved, and more specifically because of data availability constraints. The Mission estimates that as many as 8.1 million people could be receiving assistance designed to address the food access gaps from non Government channels in 2008/09. The 8.1 million number represents about 12.4 percent of the estimated 65.3 million food insecure population.

The slightly improved current Boro season production does not fully compensate for the heavy losses some farmers suffered in the previous Aman season in the south and east of the country hit by the category 4 Cyclone Sidr. The Mission estimates the aggregate 2008 rice output of Boro season of the nine affected districts at about 1 million tonnes, some 89 200 tonnes above or 10 percent higher than average. However, this increase is much smaller than the crops lost during Aman season (352 400 tonnes). The aggregate 2007/08 rice production in the flood and Cyclone Sidr affected districts is expected to be at 2.02 million tonnes, some 276 000 tonnes or 12 percent below average. Agriculture assistance, including seeds, fertilizers and tools in the worst-affected districts, and food aid/assistance programmes of WFP to vulnerable households of more than 1.5 million people will continue to be needed to the end of the year.

The producer prices of rice have been increased for Boro season. Wet paddy price in 2008 is BDT 18-20/kg compared to BDT 10-12 last year; milled rice prices vary from BDT 30-40 compared with BDT 15-16/kg last year. But due to sharecropping arrangements and lack of working capital which forces forward sales, many farmers did not get the full benefit of these price increases.

The rapid increase in the planting of hybrid varieties played a part in raising overall yields and production, but much remains to be done to ensure that farmers have access to seed of the highest genetic potential for their conditions.

Government and donor-supported Participatory Water Management Schemes have shown the way to better use of irrigation water and improved land management, especially in new lands in the south of the country.

Shortages of fertilizers, particularly TSP and MOP at planting time limited crop yields. It is absolutely essential, despite doubling or tripling of world fertilizer prices in 2008, that adequate quantities of all fertilizers are procured and distributed for the next cropping season.

The recent cyclone in Myanmar and the Sidr in Bangladesh underlines the need for national preparedness for such extreme weather events and for climate change risk.

2. SOCIO-ECONOMIC SETTING, FOOD SECURITY SITUATION AND AGRICULTURE OVERVIEW

2.1 Socio-economic situation

Over the last two decades, Bangladesh has achieved steady economic growth coupled with impressive strides in poverty reduction. The GDP annual growth rate in the 1990s averaged over 4 percent, accelerating to about 6 percent since 2000. Per capita income advanced by 3.3 percent per year and overall poverty incidence fell by 13.1 percent during the same period, with a notable decline from 48.9 percent to 40 percent occurring between 2000 and 2005. The number of underweight children, a significant indicator for food security, has been reduced from 66 percent in 1990 to 48 percent in 2004.

Key factors underpinning such progress include:

- A robust and resilient agricultural sector which, despite its dwindling share in the GDP from 30.1 percent in 1991 to 20.1 percent in 2005 – a normal outcome in a genuine development process - has posted an average yearly growth rate of 4.8 percent in the past decade, aided by targeted research and extension, notably for rice, an extensive network of all-season rural infrastructure and other Government programmes. Steady growth in this sector, notwithstanding frequent climate-related disasters, has had positive implications for poverty reduction and food security as it supports 75 percent of the country's population and directly employs about 50 percent of the labour force.
- Expansion of non-farm employment opportunities, such as in the ready-made garment industry (RMG) which employs about 2.6 million people, mostly women.
- Temporary labour migration and related remittances which in 2006 amounted to USD 5.48 billion, representing 11 percent of GDP and 35 percent of export earnings.
- Foreign direct investment (FDI) as well as private domestic investment spurred by a relatively conducive business investment climate, following liberalization policies initiated in the early 1990s, and a prudent monetary policy resulting in the reduction of inflation in recent years.
- The development of micro-credit by the Grameen Bank which is essentially owned by, and caters to, the poor. Its network of services extends to about 76 000 villages across the country and 96 percent of its 7 million borrowers are women.
- Social safety nets and other specific poverty reduction programmes such as the Vulnerable Group Development (VGD) which focuses on improving the nutritional status of the poorest rural women and

their children. These Government-sponsored programmes are backed by donors, and UN agencies like WFP and UNICEF which, along with NGOs, play a major role in implementation.

- Government rice procurement and agricultural input subsidy programmes, to be discussed in more detail below.

Although hailed as one of the few countries most likely to achieve most of the MDGs by 2015, Bangladesh is aware that its path towards development is fraught with major constraints and uncertainties: Its resource base, notably agricultural land, is stretched to the limit, while population is still growing, albeit at a slower pace than in previous decades; non-farm employment opportunities are not being created fast enough to ease pressure on the land. The ready-made garment industry, a low-skill sector, may in future lose market share to cheaper and more efficient competitors like China. There is also concern about the medium- to long-term sustainability of subsidies to the agricultural sector, as they may divert resources from more productive programmes (e.g., maintenance of rural infrastructure, agricultural research and technology transfer), while further straining Government's budget and the balance of payments. Still, the current account balance posted surpluses of USD 824 million and USD 952 million in 2005-06 and 2006-07, respectively, due in large part to migrant workers' remittances. Indeed for fiscal 2006/07, the latter amounted to almost USD 6 billion, representing about 8.80 percent of GDP and 49 percent of total export earnings.

Strategies to overcome the constraints listed above and stay the course of robust economic growth and accelerated poverty reduction have been outlined in the Government's Poverty Reduction Strategy Paper (PRSP) and other documents such as the National Food Policy. They call for, among other things, increased productivity in agricultural and non-farm activities, the development of small and medium enterprises with specific focus on the promotion of agro-based industries, the diversification of agricultural production into higher value crop chains such as fruits and vegetables as well as the expansion of fisheries and livestock production, all of which imply the promotion of a knowledge-based, high-tech agriculture.

Table 1. Bangladesh: Key economic indicators, 2002-2008

	2002	2003	2004	2005	2006	2007	2008
Real GDP growth rate (percent)	4.4	5.3	6.3	6.0	6.6	6.4	6.2
Consumer price inflation	3.3	5.7	9.2	7.0	6.8	9.1	8.5
Exchange rate	57.9	58.2	59.5	64.3	68.9	68.9	68.7
Export f.o.b. (USD bn) ^{1/}	6.1	7.1	8.2	9.3	11.6	12.4	12.6
Import c.i.f. (USD bn) ^{2/}	7.8	9.5	11.2	12.5	14.4	16.7	18.3
Current-account balance (USD m)	0.7	0.1	-0.3	-0.2	1.2	0.8	-0.3
Agriculture, value added (percent of GDP)	24	23	22	21	20	20	20
Rural population (percent of total population)	76	76	76	75	75	74	74
Population (million)	131.57	133.4	135.3	137.2	139.1	141.1	143.0

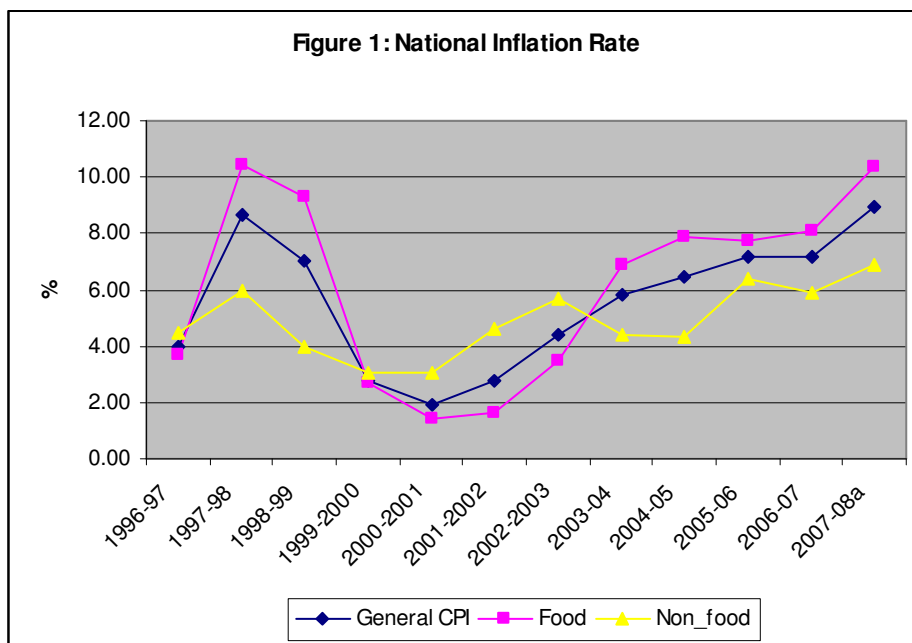
Source: EIU, BBS (Population), and WDI.

^{1/} Free on board

^{2/} Cost, insurance and freight.

2.2 Inflation, poverty and population

After reaching a trough of 1.94 percent in 2001, the overall price index has since been under upward pressure, reaching 8.95 percent in 2007/08 as can be seen in Table 1 above. Figure 1 shows that when the index is disaggregated into non-food and food items, it is mostly the latter that has been driving its ascending trend.



2.3 Agricultural sector

Land holding systems

It is estimated that 10 percent of farmers in Bangladesh own 50 percent of the land. About 60 percent of farmers are functionally landless and depend on sharecropping land owned by landlords. Average farm sizes are very small, too small to support a family adequately. In Dinajpur District the typical farm area is 21 decimals, i.e. 0.21 acres or less than 0.1 ha. Conversely, some farmers in Dinajpur own 50 acres and these farmers have the working capital to buy the best inputs. Apart from sharecroppers, approximately 20 percent of farmers are regarded as marginal and 20 percent are regarded as viable.

The Mission learned that sharecroppers bear all the costs of production of the rice crop and other crops, including water costs of 20-25 percent of the crop production. The sharecropper then shares 75-80 percent of the crop equally with the landlord, thereby receiving from 37.5-40 percent of the total crop for his work and investment. This is hardly equitable and its long term sustainability, with ever-smaller land parcels being cultivated with minimal inputs, thus depleting the land of all its fertility and organic matter, is questionable.

Sharecroppers often do not have the necessary collateral to obtain loans from commercial banks and this makes them dependent on local moneylenders who charge very high interest rates of typically 10 percent per month over the 3-4 month duration of the crop. Expenditure on improved seeds, adequate fertilization and necessary pesticides is curtailed under this system. Also, the sharecropper does not have the incentive to manage the land for the long-term, but instead farming it for maximum short-term gain. It is, therefore, little wonder that soil organic matter levels are declining as every available product of the land is utilized for food, animal feed and fuel, leaving little biological material on the soil to be recycled into soil organic matter.

Agricultural credit

Given the fact that up to 60 percent of farmers are functionally landless with little or no collateral, the possibility of obtaining agricultural credit for working capital is severely constrained. The Mission was informed that many farmers do not understand and cannot complete the paperwork involved in obtaining seasonal credit from commercial banks. Many farmers also have a history of credit default and so are not eligible for seasonal loans.

Commercial banks' lending rate is 13 percent, and now 10 percent for crop loans, while concessionary rates are available for production of pulses and oilseeds. However, the lack of collateral, poor credit history of many smallholders prevents them from accessing the bank loans. Thus the prevalence of informal system lending, based essentially on in-kind transactions, with the possibility of the farmers/sharecroppers being exploited by money-lenders and traders.

Fertilizer supply

The main fertilizers in use are urea, triple superphosphate, muriate of potash and zinc sulphate. Smaller amounts of Diammonium Phosphate are also used as a source of N and P while, gypsum and sulphur and copper compounds are also used as large areas of the country are deficient in calcium, sulphur and copper. Most potash and phosphatic fertilizers are imported as there are almost no sources of these elements in Bangladesh.

Until 1991 the importation, distribution and marketing of all fertilizers were carried out by a parastatal organization, the Bangladesh Agriculture Development Corporation (BADC). Following several studies aimed at improving the supply of fertilizers, including one by the International Fertilizer Development Centre (IFDC), the Government changed the system and asked the private sector to import non-urea fertilizers. The Government appointed dealers at the district, upazila and union levels and these dealers kept stocks of urea obtained from the Bangladesh Chemical Industries Corporation (BCIC) and non-urea fertilizers were procured from private importers. This system was changed in 2005 when the Government again asked BADC to import non-urea fertilizers along with private sector importers. Farm-level distribution is now controlled by the Government. The extension service is very heavily involved in the administration of fertilizer distribution and the administration of the fertilizer subsidy schemes and this takes them away from their normal work of providing farmers with technical advice. Many farmers and extension staff in private and public meetings across the country expressed dissatisfaction to the Mission with the current system of fertilizer distribution, noting that the system as currently managed is not achieving the objective of providing farmers with access to the right fertilizers in the right quantity at the right time.

The methods of selling fertilizers vary across districts and even across upzailas within districts. The tools applied include cards, slips, farmers' lists or priority lists provided by local administration. In some districts fertilizers were only sold once a week and farmers had to queue for their allocation and many farmers reported that, despite losing several days of work, they failed to get any fertilizer and had to buy at high prices from private sources. Civil administrators such as District Commissioners reported spending over half their work time in fertilizer distribution to the detriment of their normal activities.

Focus group discussions with the Mission indicated that there were severe shortages of MOP and TSP at planting time, an example of which is indicated by data from Sherpur District, below:

Table 2. Fertilizer used by farmers in Sherpur District

Name of Fertilizer	Amount used/applied in kg/ha		
	Recommendation	2007-08	Deviation (%)
Urea	247	247	0
TSP	104	99	(5)
MoP	148	49	(67)
Gypsum	56	49	(11)
Zinc	9	7	(19)

Urea is produced locally using natural gas as a feedstock by BCIC in a number of factories. Urea production peaked at 2.1 million tonnes in 2002-03 and since then production has been falling and now ranges from 1.4-1.7 million tonnes per annum. This is due to reported gas shortages in the last six months combined with ageing manufacturing plant. The annual demand for urea is 2.8 million tonnes, of which the local factories can supply, at most, 1.8 million tonnes.

This year, while farmers had adequate supplies of urea available to them, not enough TSP and MOP were available and this resulted in some crops being planted without a basal dressing of P and K, which undoubtedly had an adverse effect on yields. However, the earlier crop of potatoes had been given liberal applications of TSP and MOP and it was expected that there would be some residual P and K available for the Boro rice crop. In addition, the floods and Cyclone Sidr which occurred in late 2007 deposited large quantities of nutrient-rich silt on Boro lands, somewhat offsetting the lack of a basal fertilizer dressing on some farms.

In common with the rest of the world, fertilizer prices in Bangladesh have risen very sharply during 2008. The cost of TSP and MOP rose from BDT 16 last year to BDT 50 and BDT 40 per kg, while the cost of urea was maintained at BDT 6 per kg by a high Government subsidy. Given the cropping intensity of farming in Bangladesh and the low soil organic matter content in the soils in many districts, it is absolutely essential that,

despite the high international prices, sufficient supplies of the main fertilizers be maintained and that procurement decisions are made for supplies to be available well in advance of the next Boro crop.

Some respondents informed the Mission that it was necessary for Government involvement in fertilizer procurement and distribution to ensure fairness of distribution in a time of perceived fertilizer shortages. Having sufficient fertilizers at the right time, is not an option but a necessity for Bangladesh and despite high international prices for TSP and MOP, sufficient stocks must be procured well in advance of need. The Mission learned that there are adequate foreign exchange reserves available at present to finance the procurement of fertilizer for the coming year. It is vital that this procurement be made on time and that the distribution system is efficient and timely. Liberalization works if it is known that there are plenty of supplies, with competition between suppliers putting a brake on prices. Failure to provide sufficient fertilizer for a second year will compromise food security in the country and could further exacerbate already serious soil fertility and soil nutrient imbalances.

The Mission noted that broadcasting was the recommended method of applying both MOP and TSP fertilizers. Broadcasting is suitable for MOP, but not for TSP. This is because phosphate does not move in the soil and hence should be applied to the root zone of the plant where it is immediately available to the emerging roots. Placement of phosphate in this way would result in much better response and also it is possible that application rates of this expensive input could be reduced significantly while maintaining response to phosphate.

Also, it must be noted that having sufficient and balanced supplies of inorganic fertilizers will not alone provide sustainable food production into the future for Bangladesh's high and growing population. The maintenance of adequate soil organic matter and the continued presence and healthy growth of sufficient beneficial soil micro-organisms and soil fauna are essential for sustainable productivity into the future. This will require the use of more organic manures, mulches, better crop rotations and the wide scale introduction of conservation agriculture technology into Bangladesh. The current land management system needs to be changed considerably if sustainable agricultural production is to be maintained.

Irrigation

With the exception of the haor areas of the country (8 percent), the upland dry season Boro rice crop in Bangladesh is dependent upon either surface or underground irrigation water. The number of irrigation units (DTW, STW and LLP) has been increased by 8 percent this year compared to the previous year and the area coverage of irrigation by 6 percent in the important rice growing districts in Rajshahi and Dhaka Divisions. With easy availability of irrigation appliances, farmers are becoming more independent for their water sources, so irrigation units are increasing in a faster way than the coverage. Area coverage is governed by the total rice land of the region which is not easy to expand.

Table 3. Irrigation changes in recent years in selected districts

Production indicator	DAE		
	2006-07	2007-08	Change (%)
Number of irrigation units (000)	485	524	8
Coverage of irrigated area (000 ha)	1 580	1 680	6

Source: DAE in selected Rajshahi, Rangpur, Dinajpur and Dhaka districts.

Agricultural mechanization

Animal draught power has gradually been supplemented by the use of two-wheel tractors. However, there are opportunities to use these machines more widely for transport, for threshing and other agricultural tasks. Training in the maintenance of these machines is also recommended.

General crop production

Crop production in Bangladesh is focused mainly on rice production, with 79.4 percent of the land area under this crop. Three separate rice crops are recognized, the rainfed Aus crop with 10 percent of area, the rainfed Aman crop with about 51 percent and the increasingly important irrigated Boro crop with about 39 percent of the cropped area. Area, yield and production of Boro rice are expected to increase by 9.05 percent, 7.45 percent and 17.2 percent respectively, unless affected by harvest-time storms and rains.

As noted in the table below, little land is used to grow nutritionally important foods such as vegetables, fruits, pulses and oilseeds. Pulses and oilseeds have declined markedly over recent years, with pulse area

declining from 696 000 ha in 1995-96 to 337 247 ha in 2005-06. Production of pulses declined from 523 000 tonnes to 279 000 tonnes in the eleven years to 2005-06.

Oilseed area declined from 554 656 ha to 342 105 ha during the same period, though production increased to 577 000 tonnes.

Table 4. Bangladesh: Percentage of land area planted to crops

Crop	Land area percentage in 2004-05
Rice	79.4
Wheat	4.09
Pulses	>2.80
Oilseeds	>2.37
Potato	>2.39
Jute	>2.86
Fruits	>1.36
Sugar cane	>1.15
Tea	>0.39
Spices and condiments	>2.21
Vegetables	>2.14

Rape and mustard are the predominant oilseed crops with 78 percent of cropped area, while groundnut has 9.29 percent of the area allocated. The main pulses are lentils (40.17 percent), Khesari (38.8 percent), mung and gram (9.72 percent). The main fruits are banana (29 percent), mango (13.5 percent), pineapple (10 percent), jackfruit (3.9 percent) and other fruits (36.2 percent). The most important vegetables are aubergine (19.7 percent), pumpkin (6.7 percent), rum – *Colocasia* spp (8.18 percent) and tomato (6.1 percent).¹

Food production in the Aman season in 2007

The July/August 2007 floods affected some 11.4 million people and damaged 13 percent of the total rice crop. The districts most affected by the monsoon floods were Kurigram, Lalmonirhat, Rangpur, Gaibandha, Bogra, Serajganj, Pabna, Manikganj, Munshiganj, Faridpur, Madaripur, Shariatpur, Sherpur, Jamalpur, Tangail, Netrokona, Sunamganj and Sylhet.

Cyclone Sidr, a Category IV storm, with wind speeds of up to 240km/hour, struck Bangladesh on 15 November 2007. The districts most affected by Cyclone Sidr were Barguna, Bagerhat, Pirojpur, Jhalokati, and Patuakhali. Government estimates indicated that a total of 8.9 million people or nearly 2 million households were affected by Cyclone Sidr. In the five most affected districts some 18 percent of the poultry, 11 percent of goats and sheep, 7 percent of ducks and some 3 percent of the cattle and buffalos were lost. The FAO impact assessment reported that “up to 70 percent of the Aman season crops, mainly rice and grass pea, were damaged in the severely affected sub-districts and between 20-40 percent in the moderately damaged sub-districts.” For more data on the worst affected districts, see Table 6 below.

Nearly 1.5 million houses and some 4.1 million trees were damaged in addition to the loss of a large number of livestock, fish ponds and fishing boats and equipment. The Sunderban mangrove forests, a World Heritage Site and the largest in the world, incurred severe damage. In the Sundarbans some 4-5 percent (20-25 000 ha) of forest area was badly damaged and nearly 15 percent (60 000 ha) partially damaged. Some alien species, which had been planted in various parts of the Sundarbans on a pilot basis, were uprooted while in the severely-affected areas a large number of trees have been broken from the stem or uprooted.²

The Sundarbans form a natural buffer protecting millions of people in Bangladesh from the Bay of Bengal and provide critical breeding grounds for fisheries. In addition to significant environmental and ecological functions, the Sundarbans also play major social and economic functions and many communities depend on them for their livelihoods.

¹ 2005 Handbook of Agricultural Statistics, Bangladesh Bureau of Statistics.

² FAO Report - Bangladesh Emergency Programme. Edition 28 January 2008.

3. FOOD PRODUCTION IN 2007/08 (NOVEMBER/OCTOBER)

3.1 Factors affecting 2007/08 Boro crops

Area planted – comparison of BBS and DAE figures

Two sets of production data are prepared, by the Bangladesh Bureau of Standards (BBS) and the Department of Agricultural Extension (DAE). The Mission noted major discrepancies and differences at district level between the two data sets in terms of area planted, yield estimates and other variables. In a few areas, such as Dinajpur, the DAE and BBS and the local provincial administration agree on a single data set. BBS does not have enough staff in the districts to carry out its cluster surveys and crop cuts in the required frequency. Greater cooperation and coordination between BBS and DAE in the gathering and compilation of agricultural statistics at district and upazila level is desirable.

Rainfall in 2007/08

Heavy flooding and Cyclone Sidr, which struck Bangladesh in November 2007 caused the loss of an estimated 1.4 million tonnes of rice. The Cyclone also delayed harvesting of potato and other crops, which in turn delayed transplanting of the Boro rice crop.

The Boro rice crop is irrigated and thus does not depend on rainfall. However, the 2007/08 Boro season was characterized by a few intermittent showers which improved water supplies and reduced water costs to this crop. The winter season had been cool with adequate rainfall for crop growth and this favoured the growth of wheat and potatoes, yields of which were markedly increased in many districts.

Irrigation

Considerable damage had been caused to irrigation infrastructure in the south of the country, but despite this the area under irrigation for Boro increased in most areas of the country. Efficiency of irrigation water usage is very low, at an estimated 28 percent, due to seepage from earth canals, though in some parts of the country Government and donor-funded community water management projects have improved the efficiency of irrigation and helped to improve essential maintenance of small- and large-scale irrigation infrastructure. In these areas, damage by flooding and Cyclone Sidr in 2007 was minimized, providing lessons for other areas of the country.

Some farmers in Rajshahi Division complained that there were insufficient supplies of electricity, the cheapest form of power for irrigation, but in general, Government efforts to ensure electricity supplies available for irrigation were successful. The Government also provided a subsidy on diesel costs of approximately BDT 450 per small farmer and this was also helpful as it put liquidity into the local economy. This subsidy scheme was administered by the DAE and this diverted staff from their normal extension work to a considerable extent.

Seeds

This season the use of hybrid varieties increased dramatically in many districts. These hybrid seeds are imported from China and there is some dispute about the amount of these imports, varying from 7 000–9 000 tonnes. The other main varieties grown were BR28 and BR29, both high yielding varieties which have been on the market for over 10 years. Use of low-yielding local varieties was minimal this season.

Some farmers are not familiar with the different management required by hybrid seed, especially the need to transplant early, at 30 days, not at 45 days, the period recommended for high-yielding varieties. Late transplanting of hybrids resulted in low rates of tillering, with some plants only having 6 tillers instead of the normal twenty. This resulted in lower yields on some farms.

The main HYV varieties, BRRI Dhan 28 and BRRI Dhan 29 are now over ten years old and replacements are needed. Also, new hybrid seed varieties need to be released at regular intervals to stay ahead of pest and disease attacks. There is much room for improvement in the provision of good seed in Bangladesh and more research is needed to develop improved varieties with good yield, disease and pest resistance. Various studies in Bangladesh have shown that there is a high cost/benefit ratio to investment in plant breeding and more such investment is needed now.

Agrochemicals

Farmers and extension staff remarked on the very low levels of pest and disease attacks on the Boro crop this season and this reduced the need for chemical spraying. Also, considerable efforts have been and are being made in the use of Integrated Pest Management to control pests without recourse to chemical pesticides. In Rajshahi Division, the DAE does not implement demonstrations of the correct use of pesticides, including herbicides. Use of herbicides is estimated at 10-15 percent of cropped rice area and farmers interviewed were familiar with a number of commercial herbicide products. Herbicides, especially pre-emergence herbicides, offer the possibility of increasing yields through prevention of weed competition.

There is a steady increase in the use of herbicides with many farmers consulted by the Mission being familiar with the use of three products, despite lack of overt extension support. The use of pre-emergence herbicides removes weed competition and enhances yields while reducing labour costs. As farmers are clearly using these products without advice from research or extension, it is desirable that research and extension should become familiar with their proper usage so that they can advise farmers to use the correct product for the weed flora in their areas

Pests and diseases

The most commonly seed diseases were Bacterial Leaf Streak and Bacterial Leaf Blight on hybrid rice. These diseases were exacerbated by the imbalance in the use of NPK fertilization. Some farmers in Bogra and Gaibandha used an antibiotic, Streptomycin, as a control measure, having heard of its use on Indian TV, but this practice was universally discouraged by extension officers. The use of Muriate of Potash as a spray at the rate of 1-5 kg/ha, with dressings of sulphur and copper containing supplements was advocated instead and good results were reported from these treatments with K of affected crops.

Damage by stem borers and other pests were reported to be minimal this season, with no spray treatments being required.

3.2 Rice yield and production in 2007/08 (November/October)

Table 5 presents area, yield and production of rice for Aman (2007), Boro (2008), and Aus (2008) and comparison with those of 2006/07 and five-year average. The district level estimate is reported in Table A3.

Yield and production of Boro rice in 2008

The Mission estimates a national average Boro rice yield of 3.78 t/ha, an increase of 9.05 percent above the national yield for the previous year of 3.52 t/ha (Table 5). Rice production is estimated at 17.539 million tonnes, approximately 17 percent above previous year and 29 percent over the five-year average.

The crop cut results of Nilphamari showed yield of BRRI Dhan 28 as 3.42 t/ha (clean rice) while in Sherpur the crop cut results for different varieties were 5.42 t/ha for hybrid and 4.67t/ha for HYV. A crop cut of BRRI Dhan 29 on a large farm in Tangail indicated a yield of 12.5 t/ha of paddy or 8.125t/ha of rice. This indicates the potential production if all inputs are available at the right time, in the right quantities and used properly.

Production forecast of Aus rice in 2008

According to IRRI, "over the last three decades, the area under high-yielding Boro rice has increased from 0.8 to 3.4 million ha, at the expense of the very low-yielding and risky deepwater Aman and upland Aus rice crops. Over this period, the area under Aus rice has declined from 3.4 to 1.3 million ha and that of deepwater Aman rice from 2.1 to 0.7 million ha. However, Aman rice still covers 5.7 million ha. Recently, some Aus rice land has been diverted for the cultivation of high-value vegetable and fruit crops"³

The Aus rice crop is rainfed and planted in April/May and harvested in July and August. This year the area planted to Aus rice is estimated by the Bangladesh Bureau of Statistics at 1.041 million hectares, an increase of 135 145 ha, or 14.9 percent above last year's area of 905 995 ha. Production is also forecast to be higher at 1.647 million tonnes, an increase of approximately 9 percent above the level of the previous year (Table 5).

³ International Rice Research Institute (IRRI) –Science – Rice Statistics by country. General Information, Bangladesh.

Aggregate rice production in 2007/08

As shown in Table 5, aggregate rice production in 2007/08 (including 2007 Aman, 2008 Boro and Aus) is forecast at 28.849 million tonnes, some 5.6 percent above those in the previous year and 12.4 percent above the five-year average.

Table 5. Bangladesh: 2007/08 rice production forecast and comparison with the previous year and five-year average (area in '000 ha, yield in tonne/ha, production in '000 tonnes)

	2007/08 forecast	2006/07	Five-year average (2002/03- 2006/07)	2007/08 compared to average (100 %)	2007/08 compared to 2006/07 (100 %)
Aman					
Area	5 048	5 415	5 134	98.3 percent	93.2 percent
Yield	1.91	2.00	2.03	94.4 percent	95.6 percent
Prod	9 662	10 841	10 404	92.9 percent	89.1 percent
Boro					
Area	4 643	4 258	4 035	115.1 percent	109.1 percent
Yield	3.78	3.51	3.36	112.5 percent	107.5 percent
Prod	17 539	14 965	13 567	129.3 percent	117.2 percent
Aus					
Area	1 041	906	1 082	96.3 percent	114.9 percent
Yield	1.67	1.69	1.53	109.4 percent	98.6 percent
Prod	1 647	1 512	1 688	97.6 percent	108.9 percent
Total					
Area	10 732	10 579	10 251	104.7 percent	101.4 percent
Yield	2.69	2.58	2.50	107.4 percent	104.1 percent
Prod	28 849	27 318	25 660	112.4 percent	105.6 percent

Source: 2007/08, Mission's estimates; 2002/03-2006/07, Bangladesh Bureau of Statistics.

3.3 Boro and aggregate annual rice production in cyclone-affected districts in 2007/08 (November/October)

Overall, the 2008 Boro season is deemed to be a good one, though it must be considered that the two previous rice crops were badly damaged by floods and a cyclone. This Boro production does not fully compensate for the heavy losses some farmers suffered in the previous Aman season in the south and east of the country. In the cyclone-affected districts, production was slightly less than in the previous year, due to lack of fertilizer and improved inputs.

Flood and cyclone damage to the transplanted Aman rice crop in 2007 was estimated at up to over 50 percent in the worst affected areas (Table 6). Most districts are estimated to have a good production of Boro season, due to increased areas and favourable weather. Farmers made every effort to increase production of Boro rice. Increases in area came from former wheat land, river basins, dry ponds and planting along river banks. Some farmers planted hybrid seedlings which were over the recommended 30 days old and this resulted in poor tillering. TSP and MOP fertilizers were not always available, but farmers considered that heavy applications to the preceding mustard and potato crops and the nutrient rich silt brought down by the floods and Cyclone Sidr in 2007 were expected to compensate somewhat for fertilizer shortage for the Boro season. Pest and disease attacks were minimal this year due to favourable weather conditions.

The aggregate 2008 rice output of the Boro season of the 9 worst-affected districts is forecast at about 1 million tonnes, some 89 200 tonnes above or 10 percent higher than average. However, this increase is much smaller than the crops lost during the Aman season (352 400 tonnes). The aggregate 2007/08 rice production in the flood and Cyclone Sidr affected districts is expected to be at 2.02 million tonnes, some 276 000 tonnes or 12 percent below average.

Table 6. Rice production in the Cyclone Sidr-affected districts of Barisal Region ('000 tonnes)

District	Aman			Boro			Aggregate (Aman, Boro and Aus)		
	Average (2005 & 2006)	2007	2007 over average	Average (2006 & 2007)	2008	2008 over average	Average (2005/06 & 2006- 07)	2007/08	2007/08 over average
Barguna	170.0	92.9	0.55	0.2	0.8	4.24	231.5	157.7	0.68
Barisal	168.7	126.9	0.75	177.4	175.2	0.99	391.8	343.1	0.88
Jhalokati	64.2	58.6	0.91	23.3	32.6	1.40	186.7	155.6	0.83
Patuakhali	301.4	195.3	0.65	2.2	10.5	4.73	337.1	271.1	0.80
Pirojpur	111.1	92.8	0.83	39.4	48.2	1.22	233.6	200.5	0.86
Faridpur	81.5	38.7	0.47	120.4	129.4	1.08	220.3	194.7	0.88
Gopalganj	32.4	15.5	0.48	277.6	302.7	1.09	323.9	331.9	1.02
Madaripur	48.2	24.6	0.51	149.4	149.9	1.00	205.0	185.4	0.90
Shariatpur	28.7	8.6	0.30	120.3	150.0	1.25	163.1	177.0	1.09
Total	1 006.3	653.9	0.65	910.1	999.4	1.10	2 293.0	2 017.0	0.88
		-352.4 ^{1/}			89.2 ^{2/}			-276.0 ^{3/}	

Source: 2002/03-2006/07, Bangladesh Bureau of Statistics; 2007/08, Mission's estimates

1/ Difference of total rice output between 2007 Aman season and the average

2/ Difference of total rice output between 2008 Boro season and the average

3/ Difference of total rice output between 2007/08 rice and the average.

3.4 Other crops and livestock

The Department of Agricultural Extension has published the following statistics on area, yield and production of major crops for the period 2006-2008, as shown in Table 7.

Table 7. Area, yield and production of maize, wheat and potato (area in '000 ha, yield in tonne/ha, production in '000 tonnes)

	2006			2007			2008		
	Area	Yield	Prod.	Area	Yield	Prod.	Area	Yield	Prod.
Maize	122.0	5.807	708.3	193.6	5.816	1126.2	342.6	6.100	2089.9
Wheat	481.0	1.605	772.0	372.7	2.053	765.0	369.9	2.584	956.0
Potato	373.2	14.384	5368.4	376.7	13.996	5272.6	520.4	17.748	9236.8

Source: 2006 and 2007, Bangladesh Bureau of Statistics; 2008, Mission's estimates

Wheat

Wheat production has been declining over recent years, from 1.83 million tonnes in 2001-02 to 735 462 tonnes in 2005-06. This year, the area planted to wheat has declined by 2 798 ha or 7.5 percent compared to 2007 and the land was planted instead to Boro. The main reason for the decline in wheat area is weather, which in recent years has been blamed for low yields. If low temperatures are prolonged in the winter season, the yield of wheat is increased. If winter is short the yield declines because of the temperature sensitivity of this crop. This season had a long cool period and wheat yields in 2008 were much improved at 2.584 t/ha compared to 2.053 t/ha the previous year, resulting in production of 955 963 tonnes, an increase of 190 915 tonnes, or almost 25 percent above the previous year's harvest.

Potato

According to DAE figures, potato area has increased by 38.2 percent this year to 520 447 ha with farmers planting the crop between transplanted Aman and Boro rice. The DAE estimates potato production this year at 9.236 million tonnes, an increase of 75.2 percent above that of the previous year. Higher prices for potatoes were the main influence in expanding area planted to this crop. A major concern is the availability of cold storage for potatoes, given that production has risen from 5.3 million tonnes to over 9 million tonnes this year.

Maize

The area of land planted to maize has been increasing rapidly in recent years, from 121 962 ha in 2006 to 193 630 ha in 2007 to 342 614 ha in 2008. The crop can be grown throughout the year, but 95 percent is

planted in the Rabi season from October to late-December. Production has also increased this year by 85.6 percent to 2 089 945 tonnes at a yield, estimated by the Mission, of 6.1t/ha. Hybrid seed is used. With this level of yield, maize is a profitable crop and there is a very large demand for it as a component of poultry feed. Maize stover is a valuable livestock feed. Because of the high price of rice some poor farmers are mixing maize flour with wheat flour in making bread.

Livestock

Bangladesh, for its size, supports huge numbers of cattle, sheep, goats, poultry and ducks as shown in Table 8 below. Cattle and buffalo numbers rose by 2 840 434 heads or 16.5 percent from 1996 to 2005, while sheep and goat numbers increased from 14.61 million heads to 17.46 million, or 19.5 percent. Poultry and duck numbers rose spectacularly in the same period from 126.67 million to 188.4 million, or 48.7 percent.

Livestock are an important source of income and a store of value for the many millions of families that own them. They also provide milk, meat and eggs to supplement the generally poor diets of the people. However, extension staff noted that often well over 50 percent of cattle manure is dried and used for fuel, thereby further depleting the already low levels of organic matter in the soil. This is a serious problem, for without organic matter, the water and nutrient holding capacity of the soil is much reduced, lowering soil fertility.

Finding adequate forage for ruminants is a continuing problem, given the intensity of cultivation and the rapid increase in overall livestock numbers as shown in the Table below. Also, prices of poultry and other livestock feeds have risen in line with other grain products, threatening the economic viability of layer and broiler businesses throughout the country.

Avian influenza outbreaks were first reported in March 2007 and since then over 1.6 million birds have been culled at 546 farms in the country, including 504 commercial and 42 private or backyard farms. Avian flu has been reported from 47 of the 64 districts in Bangladesh⁴ and was quickly controlled by destroying affected birds and all other birds from surrounding farms. Training is being given to Livestock Extension Agents on Avian Influenza and the number of outbreaks continues to decrease.

Outbreaks of mucosal disease and Newcastle Disease are sporadic in the poultry flock. Peste de Petit Ruminants (PPR) was introduced to Bangladesh from Kenya in 1993 and now is a major disease of goats and sheep. Some farmers vaccinate their animals against the major diseases such as Black Quarter, which is an important disease of cattle.

No other major outbreaks of cattle, sheep or goat diseases were reported during the year. Staff of the Livestock Division consulted by the Mission noted lack of transport and equipment as constraints to their efforts to provide livestock extension and disease prevention and control services to meet the demands of livestock owners.

Table 8. Bangladesh: Livestock population (million)

Species	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Cattle	22.02	22.09	22.16	22.23	22.31	22.38	22.46	22.53	22.60	22.67	22.80	22.87
Buffalo	0.72	0.76	0.79	0.84	0.88	0.92	0.96	1.01	1.06	1.11	1.16	1.21
Goat	13.19	13.76	14.35	14.96	15.60	16.96	16.96	17.68	18.41	19.16	19.94	20.74
Sheep	1.71	1.78	1.86	1.94	2.02	2.10	2.20	2.29	2.38	2.47	2.57	2.68
Chicken	103.2	109.9	117.0	124.6	132.7	142.7	152.2	162.4	172.6	183.5	194.8	206.9
Duck	29.90	30.64	31.41	32.19	33.0	33.83	34.67	35.54	36.40	37.28	38.07	39.08

Source: Department of Livestock Services, Bangladesh.

⁴ FAO and Ministry of Fisheries and Livestock update of 17 April 2008.

Table 9. Bangladesh: Livestock population ('000) by division

Division	Cattle	Buffalo	Goats	Sheep	Fowl	Ducks
Barisal	581.9	130.6	615.2	88.2	9 839.1	4 254.2
Chittagong	3 217.8	114.5	1 468.3	222.7	19 805.8	7 111.3
Dhaka	5 502.7	87.4	3 185.9	367.6	22 913.4	6 006.8
Khulna	2 939.9	28.7	2 192.2	184.0	11 613.2	3 697.8
Rajshahi	6 692.2	116.3	4 995.1	721.1	28 222.7	5 943.3
Sylhet	1 544.0	57.7	462.3	106.4	5 157.9	2 102.4
Total 1996	21 572.1	722.8	12 919.8	1 690.0	97 552.1	29 115.8
Total 2005		25 135.3		17 459.1		188 398.3

Source: 2006 Statistical Yearbook of Bangladesh, 26th Edition, Bangladesh Bureau of Statistics, and 2005 Yearbook of Agricultural Statistics of Bangladesh, Bangladesh Bureau of Statistics.

4. FOOD SUPPLY/DEMAND BALANCE AND FOOD MARKET

4.1 Food supply/demand at national level

Rice is the staple food, contributing to over 63 percent of the caloric intake for urban consumers and over 71 percent for the rural population, on average. The percentages are much higher for the poor, while the 2005 household and income expenditure survey found that food accounted for nearly 54 percent of total consumption expenditures, a share approaching 60 percent in rural areas. These data underscore the predicament not only of the 60 million Bangladeshi still struggling to climb out of poverty, but of the millions more that soaring food prices are dragging below the poverty line. As the Mission observed, the hardest hit are fixed-income earners and rural households experiencing crop failure. While emergency measures to address this situation are suggested in later sections of the report, a national cereal balance sheet is proposed below based on the following assumptions and estimates:

- A national population estimated at 145.93 million using BBS data bases.
- A total domestic rice production of 28.849 million tonnes for the 2007-08 marketing year.
- Apparent per capita annual consumption of 162 kg for rice and 20 kg for wheat.
- Other uses and losses of rice and wheat are estimated using FAO databases.
- Relatively stable opening and closing stocks, although closing stocks are assumed to be higher than opening stocks because the Government reportedly wants to safeguard against further price increases by raising the levels of emergency stocks.
- Of the data on food import and food aid provided by the Ministry of Food and BBS, only the data from November 2007 to July 2008 (the latest available at the time of writing) are used in the balance sheet to reflect actual availability during the marketing period.
- Anticipated commercial imports are estimated at 2.57 million tonnes. Additional food security assistance (expressed in cereal equivalents) of 1.45 Million tonnes are needed to meet the needs of the food insecure population whom are unable to satisfy their minimum food consumption needs. Of this latter amount, 410,000 tonnes is recommended for import, and 1.04 million tonnes are recommended for local purchase.

Table 10. National food balance sheet for November/October 2007/08 ('000 tonnes)

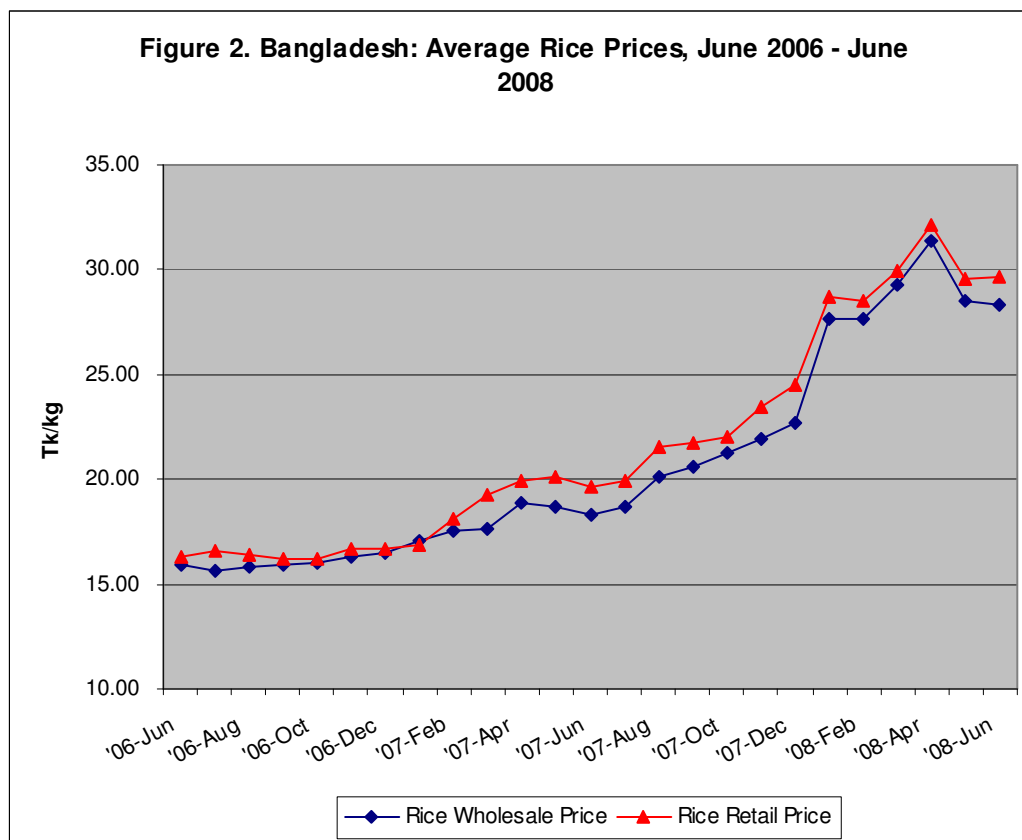
	Rice	Wheat	Total rice and wheat
Domestic availability	32 349	1 840	33 688
Opening stocks	3 500	1 000	4 500
Total production	28 849	840	29 188
2007 Amam season	9 662		
2008 Boro season	17 539		
2008 Aus season	1 647		
Total utilization	33 226	4 033	37 259
Food use	23 703	2 919	26 621
Seed use	119	15	134
Losses and other uses	4 904	100	5 004
Comm. & informal exports	0	0	0
Closing stocks	4 500	1 000	4 600
Total Imports	877	2 193	3 070
Anticipated Commercial/Food aid Imports	1 270	1 645	2 915
Food Aid received or committed	75	80	155
Substitution between Rice and Wheat	-469	+469	0
Gap	0	0	0

Source: Government statistics, Mission's estimates.

With total domestic rice availability and utilization assessed at 32.349 million tonnes and 33.226 million tonnes respectively, estimated required imports amount to 877 000 tonnes. Taking into account the 1.27 million tonnes of commercial imports and the 75 000 tonnes of food aid received so far, there appears a surplus of 469 000 tonnes of rice which will be used as a substitute for wheat imports. A similar exercise for wheat reveals a gap of 814 000 tonnes, bringing the deficit for both cereals to 345 000 tonnes after substituted 469 000 tonnes of rice surplus. If at this stage of the 2007/08 marketing season this shortfall can be met by further commercial imports and/or food aid from the donor community, the overriding issue remains how to address the food needs of those segments of the population whose purchasing power has been severely eroded by soaring rice prices and the food-led inflation in general and will be addressed in Section 5.

4.2 Market prices, integration and rice consumption

Concerning the cost of food items, the surge in rice prices in recent months has been the major cause for concern. As shown in the figure below, whole and retail prices of local coarse rice, the nation's major food staple, have increased by 78 and 82 percent respectively, from June 2006 to June 2008, with the fastest acceleration -38 percent (wholesale) and 36 percent (retail) - occurring between October 2007 and March 2008.



Source: Wholesale price--Department of Agricultural marketing (DAM), Bangladesh; Retail price – Daily Foodgrain Situation Report, MISM Division, Directorate General of Food, Bangladesh

This increase in rice prices is attributable to both internal and external factors. At the domestic level, severe floods that swamped large tracts of agricultural land in August and September 2007, and particularly Cyclone Sidr that hit the country the on 7 November 2007, caused extensive devastation to crops. This has triggered fears of shortages of the staple and a scramble to secure supplies for current consumption and strategic reserves, further pushing up prices.

Rising costs of key inputs such as fertilizers have also fuelled the rice price hike. This particularly applies to phosphate and potash-based fertilizers, which are entirely imported and geared to world prices. While the Government has been subsidizing locally made urea at 75 percent, helping stabilize its price at BDT 6/kg throughout 2007/08, the price of TSP which, along with potash, receive only a 15 percent subsidy, was around BDT 35/kg at the time of the Mission. This compared to about BDT 22/kg just 12 months earlier, or a rise of nearly 60 percent. Farmers also reported that the price of fuel and electricity went up 60 percent during the same period, despite being subsidized by the Government at the rate 40 and 2 percent respectively.

An analysis by the Centre for Policy Dialogue establishes the average production cost of 1 kg of 2008 Boro rice, using the required inputs, at BDT 12.77 for paddy and 20.26 for milled rice⁵. With Government procurement prices set at BDT 18/kg for paddy and BDT 28/kg for clean rice, all key players in the production, processing and marketing chain should reap relatively comfortable profit margins, particularly if retail prices remain in the upwards of BDT 30 throughout the season.

The consumer on a low fixed income is bearing the brunt of price hikes. This indicates the need for expanded social safety nets to include those falling back into severe food insecurity and the poverty trap. Such programmes should be extended to villages that have suffered crop failure this season.

Overall, market access is facilitated by an extensive network of all-weather rural infrastructures, including paved roads, a rail system and waterways. The ubiquitous cell phone has greatly enhanced the flow and outreach of market information. But the non-existence of farmers' associations, or their weakness when they do exist, proves to be a handicap in their dealings with other market players, including Government services.

⁵ Uttam Deb et al., *Boro procurement and Food Security Strategy, An Actionable Agenda*, Centre for Policy Dialogue, Bangladesh, April 2008.

In an area the Mission visited, some farmers, shunned by traders' associations, could not sell their rice even at the recommended procurement price, despite the fact that retail prices ranged from BDT 31-35/kg.

The Bangladesh rice market has not been insulated from developments in the rice supply/demand situation in neighbouring countries or the world rice and food market at large. Owing to the devastation caused by Cyclone Nargis to large tracts of its rice land on 3 May, Myanmar will not this season be able to honour commitments to export some 600 000 tonnes of the staple food - part of which was destined for Bangladesh - adding to the expectations of a further tightening of supplies in the region and worldwide. In Thailand, the world's premier rice exporter, the price of the staple had increased to USD 567/tonne in March, up 74 percent from a year earlier with a 24 percent acceleration occurring in February alone – a trend similar to the one displayed on the Bangladesh market.

The upward pressure on prices has been exacerbated by export restriction measures adopted recently by some major rice producers. Although the intended purpose of such measures is to secure domestic stocks and tame inflation, they have had dire consequences for importing countries. Thus, as aptly demonstrated by the Centre for Policy Dialogue study quoted above, successive announcements by India of minimum export prices of non-basmati rice since October 2007 have largely contributed to the surge in rice prices Bangladesh has experienced over the last six months.

Other major producers, including China and Viet Nam, have been curbing exports. Bangladesh itself imposed a ban on non-aromatic rice export on 30 April 2008, despite expectations of above-average 2008 Boro rice production.

But such temporary measures do not address fundamental causes of the spike in rice prices and food-led inflation in general. Such causes include climate-related disasters that occasionally wipe out harvests; the expanding demand for cereals for human consumption and as animal feed, notably in emerging countries like India and China; the increasing diversion of agricultural land to the cultivation of crops used as feedstock for bio-fuels production; shrinking stocks of rice and continuing speculation about the persistence of high cereal prices; the rising costs of fuel and fertilizers; the lack of interest and investment in agriculture in many developing countries leading to chronic food shortages and related soaring prices, sparking riots and threatening security in parts of the world.

FAO's current guidelines for staving off global famine, including the rice price crisis, in the short to medium run aim at:

- (i) Providing the needed inputs to smallholder farmers, mostly in poorest, food deficit countries, to enable them to scale up their food production.
- (ii) Establishing/reinforcing food price and information monitoring systems to improve the efficiency of food markets.

As a first step for the implementation of these directives in the South East Asia region, a meeting convened on 26 April 2006 in Bangkok by FAO Deputy Director-General recommended the establishment of regional strategic grain reserves and a common strategy for the production, storage and distribution of fertilizers.

These recommendations at the regional level should be of particular interest to Bangladesh because, as explained above, policy measures concerning the rice demand/supply situation in neighbouring countries have immediate impact on its domestic prices.

5. HOUSEHOLD FOOD SECURITY

5.1 Poverty and food insecurity prevalence

Although Bangladesh has achieved considerable progress in domestic food production, poverty-related food insecurity is widespread and prevalent. Data from the last (2005) household income and expenditure survey revealed that more than 40 percent of the population (56 million people) were categorized as "Absolute Poor", failing to acquire the minimum level of food energy to maintain normal health, defined as 2122 Kcal per person per day. Within this population 27 million people were categorized as "Hard-Core Poor", failing to

acquire 1805 Kcal per person per day, and 11 million were “Ultra Poor”, failing to acquire 1600 Kcal per person per day⁶. The Hard-Core Poor and Ultra Poor represented just below 20 percent, and 8 percent of the overall population respectively. The prevalence of Absolute Poor, Hard-Core Poor and Ultra Poor had increased from 2000-2005 due to population growth (BBS 2007). There has been a further increase since 2005, due to the rapid rise in food prices and the residual effects of Cyclone Sidr and the 2007 floods. Estimates and details describing the magnitude of the increase are addressed in subsequent sections.

Food insecurity affects both rural and urban households. Of the 56 million people classified as Absolute Food Poor in 2005, 41.2 million resided in rural areas and 14.8 million in urban areas. Of the 27 million Hard-Core Food Poor, 18.7 million resided in rural areas and 8.3 million in urban areas. Of the 11 million Ultra Poor, 7 million resided in rural areas and 4 million in urban areas.

Larger households are more vulnerable to food insecurity. The HIES 2005 found that the household size is positively correlated to the incidence of poverty for both rural and urban households. Of the Absolute Poor, one-half (50 percent) are members of households with 6 persons or more, three-quarters (73 percent) are members of households with 5 persons or more. For the Hard-Core Poor, the percentages are nearly identical.

Households headed by a female are more vulnerable to food insecurity. These households tend to have a high age dependency ratio, with large numbers of household members dependent upon few income earners. Many female heads of household are illiterate, thus limiting their prospects for gainful employment and self reliance.

Rural food insecurity

A substantial proportion of rural households continue to experience chronic as well as transitory food insecurity. A variety of factors contribute to household food insecurity, including: lack of access to land for cultivation; lack of employment opportunity; loan repayment obligations; exclusion from social safety nets programmes; and vulnerability to natural disasters.

Inadequate access to land for cultivation is another major determinant of food insecurity among rural households. Bangladesh is experiencing significant reduction in per capita farm size due to factors like growing population, conversion of farm lands to non-farm use and land erosion. Of the rural population that is landless, 60 percent are classified as Absolute poor, 33 percent are Hard-Core poor and 15 percent are Ultra poor. Of the rural population owning very small plots of land (sized between 0.1 hectare and 0.5 hectares), 48 percent are classified as Absolute poor, 24 percent are Hard-Core poor and 10 percent are Ultra poor. Analysis of the HIES 2005 data confirms that the size of land owned is negatively correlated to the incidence of poverty (BBS 2007).

The major livelihood strategy in rural Bangladesh is subsistence agriculture either through agriculture production activities, agriculture labour or both. There are two pronounced lean seasons within the crop calendar, lasting from October to November and from March to April, which further aggravate the food security situation for small farmers and the agriculture labourers (TANGO 2006).

Urban food insecurity

Food security for urban households is affected by many factors, including: the participation of household members in the urban labour market; physical access to markets; cost of food items in the market and prevailing wages rates. The size of the households and the ratio of wage earners to dependents, the education level, knowledge/skill and physical capacity of individual household members all influence how effectively a household can secure sufficient food to meet its needs. Food insecurity, combined with poor hygienic condition and poor quality diet aggravate the nutrition and health status of the urban poor population. The IFPRI study of urban food security within major slum areas of Dhaka, Chittagong, Rajshahi and Khulna found that 29 percent of the slum population had expenditure levels associated with more severe food insecurity (< 1805 kcals/person/day), while 47.8 percent were food insecure (< 2122 kcals/person/day).

⁶ The HIES data reported above and below regarding numbers absolute poor, hard-core-poor etc. is based on HIES findings using the DCI/Direct Calorie Intake approach. The DCI approach was used in this context because of its more direct association with food consumption. HIES also presented findings using alternative CBN/Cost of Basic Needs Method. CBN is more widely used for estimating the incidence of poverty.

Regional differences in food insecurity and poverty prevalence

The prevalence of food insecurity and poverty varies considerably at sub-national levels. Baseline data depicting location specific poverty rates prior to the food price shock can be used to shed light on the question of “where” negative impacts could be greatest, with all other factors being equal.

The HIES 2005 Household Income and Expenditure Survey (BBS) reported spatial variations in poverty prevalence across Bangladesh’s six administrative divisions⁷. Findings were reported at overall divisional level, as well as for urban and rural populations within divisions. Poverty rates were highest in the divisions of Barisal and Rajshahi (52.0 percent and 51.2 percent respectively) and lowest in the divisions of Dhaka and Sylhet (32.0 percent and 33.8 percent respectively). By comparison; rates at national level were 40.0 percent. Table 11 below shows details for all six divisions in Bangladesh, with rural and urban breakdowns.

Table 11. Incidence of poverty by cost of basic needs method and by administrative division ^{1/}

Division	Total	Rural	Urban
Barisal	52.0	54.1	40.4
Rajshahi	51.2	52.3	45.2
Khulna	45.7	46.5	43.2
Chittagong	34.0	36.0	27.8
Sylhet	33.8	36.1	18.6
Dhaka	32.0	39.0	20.2
National	40.0	43.8	28.4

Source: Household Income and Expenditure Survey 2005; GoB Bangladesh Bureau of Statistics (May 2007).

1/ Data corresponds to the Upper Poverty Line; food expenditures at 2122 kcals/cap/day

BBS and WFP together in 2004 published and mapped estimates of poverty prevalence at lower administrative units (i.e. sub-districts/upazilas) using a method known as “Small Area Estimates/SAE”⁸. The World Bank, BBS and WFP are currently engaged in a collaborative process to update the local level poverty maps; utilizing data primarily from HIES 2005. A supporting and complimentary effort to map poverty rates based on the perceptions of key informants is scheduled to begin in September 2008. The new poverty maps produced will provide a more updated *pre-food price crisis* picture of the prevalence of poverty across regions at local level.

Combining poverty and food insecurity pre-crisis baseline data with more recent information on food prices, wages and other food security and nutrition-related variables can help to target food assistance more effectively. This type of analysis can and should be integrated with monitoring data on ongoing or planned assistance for the purpose of optimizing resource allocation.

5.2 Recent shocks and setbacks; worsening food access for the poor and food insecure

During the recent period (2007-08) three negative developments or “shocks” have contributed to worsening poverty and food insecurity for many poor and lower middle class households. These include a) the devastating monsoon floods in July-September 2007, b) the catastrophic Cyclone Sidr in November 2007, and c) the rising food prices and costs of other basic essentials occurring since mid-2007, with a subsequent rapid rise during the first and second quarters of 2008 (see rice price graph; section 4.2, Figure 2).

In the aftermath of Cyclone Sidr millions of people were in need of food assistance. Many households lost everything: shelter, household assets and productive assets needed for their livelihood. The livelihoods most affected were fishing, farming and agricultural wage labour. Despite considerable economic recovery and reconstruction efforts households in affected districts remain food insecure and are in need of continued food assistance.

5.3 Negative impacts; increasingly difficult household food access

The Mission conducted interviews with household and key informants in communities throughout Bangladesh⁹, most of the districts visited were Boro producing regions. Selected urban areas were included;

⁷ Report of the Household Income and Expenditure Survey 2005; GoB Bangladesh Bureau of Statistics (May, 2007). Results were reported using the “Cost of Basic Needs” method.

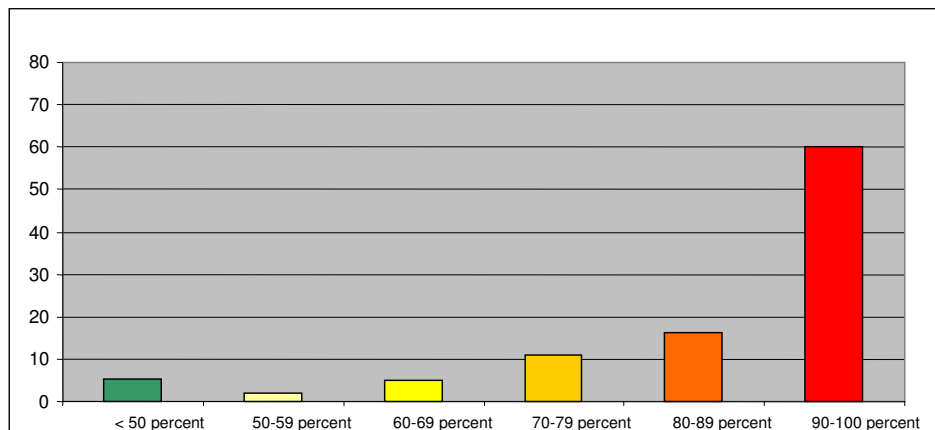
⁸ Local estimation of poverty and malnutrition in Bangladesh (2004), BBS and WFP. Also see The Food Security Atlas of Bangladesh; BBS and WFP (2004).

⁹ The Mission used a purposive sampling approach, a total of 37 of Bangladesh’s 64 districts were visited, covering all major livelihood and agro-ecological zones. A total of 244 households were interviewed, with the large majority of respondents being women (i.e. those

including Dhaka, Chittagong, Khulna and Sylhet. Whenever possible/relevant; findings from the field have been compared with two recent studies of food security in Bangladesh: “Rural Bangladesh: Socio-Economic Profiles of WFP Operational Areas and Beneficiaries” by TANGO International (2007) and “Study of Household Food Security in Urban Slum Areas of Bangladesh, 2006” by the International Food Policy Research Institute (IFPRI). Readers should be aware that both the TANGO and IFPRI surveys were based on systematic random samples as opposed to the purposive sampling used by the Mission, whereby most of the interviews were conducted with poor and very poor households. For this reason, direct comparisons cannot be made; nevertheless findings from the previous studies are included to provide context from recent years. Both the TANGO and the IFPRI data were collected during 2006, a year that was generally understood as “normal”; in that no major natural disasters or large macro-economic shocks occurred.

More than half of all households interviewed during the Mission (60 percent) reported spending between 90 percent and 100 percent of their total household expenditures on food, within the past seven days (Figure 3).

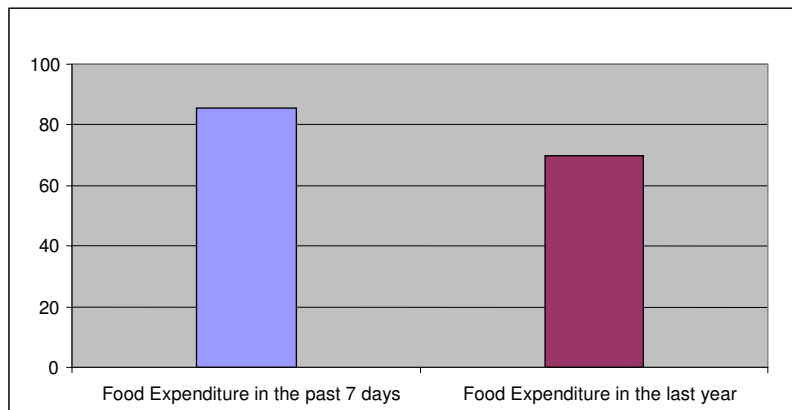
Figure 3. Percentage expenditure on food, within past 7 days



Source: Mission's estimates.

Households interviewed by the Mission were dedicating a higher percentage of their total expenditures to food purchases than last year. The mean reported household expenditure on food this year was 86 percent, compared to 70 percent at this same time last year (Figure 4).

Figure 4. Percentage expenditure on food, this year versus same time last year

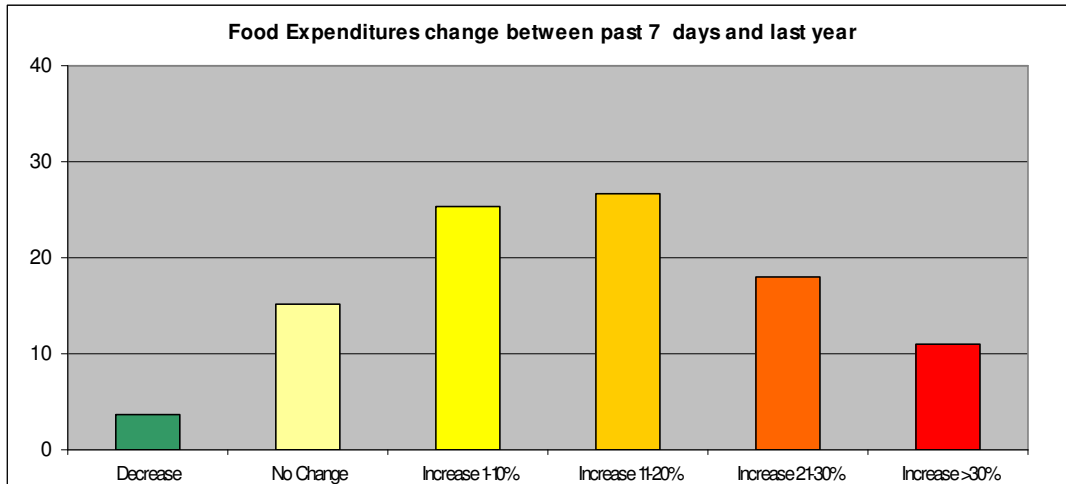


Source: Mission's estimates.

most informed about food consumption and food utilization within the household). Community interviews with key informants were conducted within upazilas (sub-districts) of each of the 37 districts visited.

The size and the distribution of the increases amongst households are depicted in Figure 5 below:

Figure 5. Percentage expenditure on food, percent change between this year and last year



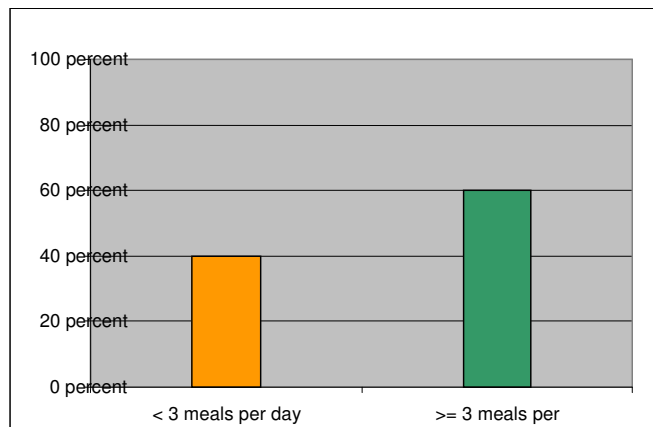
Source: Mission's estimates.

Food consumption

The Mission collected data on the frequency of meals consumed by households. The majority of households interviewed (56 percent) reported consuming three meals per day and 37 percent reported consuming 2 meals per day (Figure 6). Among households interviewed during the CFSA Mission, very few households reported consuming one meal a day (3 percent) or skipping an entire day without food (1 percent).

Mission observations are comparable to the 2006 TANGO International Study of rural households which found that only the most vulnerable households reduce their consumption to two or fewer meals a day. Other households maintain consumption of three meals per day by employing other coping strategies. The frequency of meals consumed remains a useful measure for separating the poorest households from other socio-economic classes in rural Bangladesh.

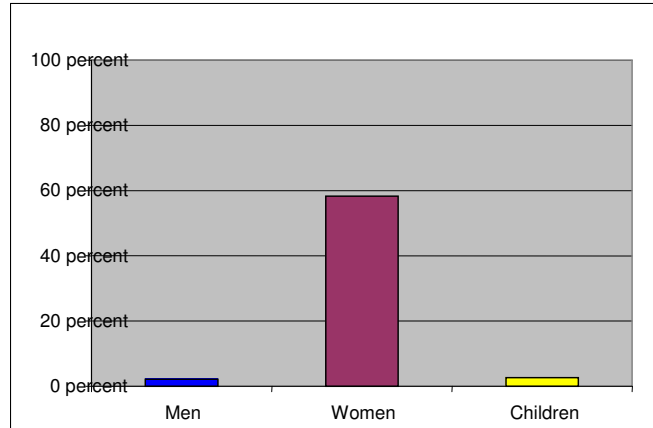
Figure 6. Number of meals consumed per day



Source: Mission's estimates.

Within individual households, frequency of meals consumed is not equal. A majority of all sampled households (58 percent) reported that women consumed fewer meals than other household members (Figure 7). Nearly two-thirds (63 percent) of sampled households reported that not everyone in the household consumes the same number of meals. Among households that reported unequal meal consumption, nearly all reported that it was women that consumed fewer meals. It is not known if this is a function of food inadequacy or reflects prevalent social practices. Nevertheless, likely adverse health effects are an issue of concern, particularly for pregnant women and those whom have recently given birth.

Figure 7. Percentage of households reporting who consumes fewer meals



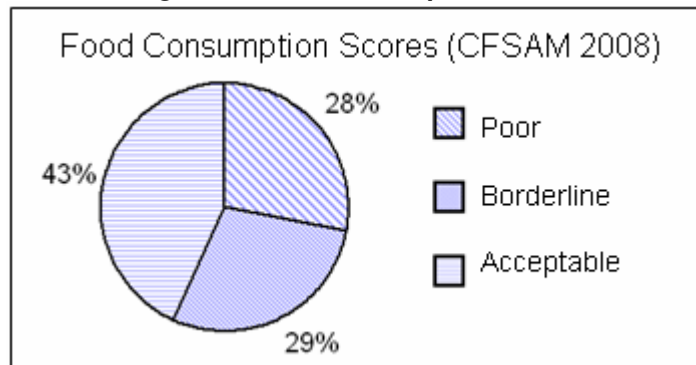
Source: Mission's estimates.

Female-headed households take their meals less frequently than do male-headed households. More than one-third of female-headed households consume two meals a day as compared to less than one-fifth of male-headed households.

Dietary diversity, as measured by food consumption scores

To measure dietary diversity, the Mission asked households to recall the foods consumed in the last seven days. Each item is given a score, depending on the number of days on which it was consumed. Each food group is assigned a weight reflecting its nutrient density. A food consumption score is calculated for each household by multiplying the frequency of consumption by weight for each food group. The household score is then compared with thresholds that indicate the status of the household's food consumption: Poor (28 or less); Borderline (28 to 42) and Acceptable (greater than 42). Among households interviewed during the Mission 28 percent had a Poor food consumption score, indicating lack of adequate diversity in their diet; 29 percent were Borderline and 43 percent were Acceptable (Figure 8).

Figure 8. Food consumption scores



Source: Mission's estimates.

There is a known and established positive relationship between malnutrition rates and high food prices¹⁰. As rice prices rise, poor households typically reduce their purchase and consumption of the more nutrient rich essential food items, like vegetables, fruits, pulses, etc. With less of these more nutrient rich foods in the diet, food consumption related malnutrition normally worsens. The absence of a recent nationally representative nutritional survey makes it difficult to state with certainty that malnutrition rates have in fact risen because of the food price rise. Nevertheless, given both the empirical evidence of this pattern from the past, and the fact that many households are reportedly switching to cheaper or less preferred food as a means of coping with higher prices (see next section), concerns about the real possibility of worsening malnutrition are warranted. UNICEF and WFP are currently planning a nutrition and household food security assessment for October

¹⁰ See Torlesse, H. Kiess, L & Bloem, M.W. 2003. Association of Household rice Expenditure with Child Nutritional Status Indicates a Role for Macroeconomic Food Policy in Combating Malnutrition. *The Journal of Nutrition* 133(5): 1320-1325.

2008. Anthropometric data and supporting information related to household food access will likely be included, thereby shedding light on the nutritional and updated food security status of the broader population.

In-kind food assistance programmes that distribute food commodities fortified with micronutrients will have an important role to play and advantage within this context. For example, the GoB and WFP's VGD programme distributes fortified whole wheat flour (Ata) which contains seven micronutrients including folic acid which is important for combating iron deficiency (anaemia). A recent study on nutritional outcomes of VGD beneficiaries by the Bangladesh Institute of Development Studies (BIDS, 2007)¹¹ compared programme participants with a control group of non-participants, using a number of nutritional indicators. Using the stunting indicator (height-for-age) for children under two years of age; 58.9 percent of children within programme participant households had height-for-age values indicative of a normal/healthy status. By comparison only 44.8 percent of children under two years of age in the non-participant households fell into the "normal" category. Similarly, the Body-Mass-Index (BMI) indicator was used with non-pregnant and non-lactating women. The percentage of VGD participant households categorized as normal was 53.5 percent, vs. a notably lower 47.2 percent for non-participant households. Results presented above for both the stunting and the BMI indicator were found to be statistically significant, thus supporting the case that food assistance programmes using fortified commodities such as Ata can contribute to positive nutritional outcomes¹².

Coping strategies

Households interviewed during the CFSAM reported using one or more of the following coping strategies on a weekly basis (i.e. strategy used at least once a week): Limit portion size at mealtime (74 percent); Reduce the number of meals consumed per day (62 percent); Rely upon less expensive or less preferred food (53 percent); reduce adult consumption so children can eat (23 percent); and have HH members eat at relatives or neighbours (11 percent).

Households interviewed in the 2006 TANGO study were asked the same questions regarding the coping strategies highlighted above. The percentage of households reporting practicing the various coping strategies, at least once a week, were as follows; Limit portion size at mealtime (51 percent); Reduce the number of meals consumed per day (46 percent); Rely upon less expensive or less preferred food (42 percent); Reduce adult consumption so children can eat (25 percent); and have HH members eat at relatives or neighbours (9 percent). For four of the five coping mechanisms, a greater percentage of households interviewed during the CFSAM interviews were relying on these coping mechanisms more, as compared to the households interviewed by TANGO during July 2006.

Many households reported borrowing either food or money from various sources on a weekly basis: Borrow food and rely on help from friend or relatives (51 percent); Purchase or borrow food on credit (45 percent); Borrow money from Friends/relatives (19 percent); Borrow from NGOs/Grameen Bank (16 percent); Borrow from Money lenders (9 percent); and Borrow from a Bank (4 percent). Purchase of food on credit, from any source entails significant risk, as a loan may be difficult to repay and lead to a spiral of debt requiring a sale of household or productive assets.

Comparing the above results to the percentages of households reportedly practicing the same coping mechanisms (at least once a week), from the TANGO 2006 survey again, shows a less frequent use of these coping mechanisms from the earlier 2006 period, suggesting a worsening in the food security situation. The TANGO survey results were reported as follows: Borrow food and rely on help from friend or relatives (27 percent); Purchase or borrow food on credit (38 percent); Borrow money from Friends/relatives (16 percent); Borrow from NGOs/Grameen Bank (5 percent); Borrow from Money lenders (7 percent); Borrow from a Bank (1 percent).

¹¹ Nutrition Outcome and Baseline Survey of Country Programme Activities of the World Food Programme, Bangladesh. Bangladesh Institute of Development Studies/BIDS (2007).

¹² Ibid. VGD participants also fared better using other nutritional indicators such as underweight, and wasting. However the positive differences noted for these indicators were not reported as statistically significant.

Table 12 below provides more detailed data on the prevalence of coping strategies used by households interviewed during the Mission's field work:

Table 12. Sustainable coping strategies, practiced weekly or practiced ever

Sustainable coping strategies	Practiced Weekly (%)	Practiced Ever (%)
Sold small animals	75	92
Limit portion size at mealtimes	74	91
Reduce number of meals eaten per day	62	82
Rely on less expensive or less preferred foods	53	84
Borrow food and rely on help from friend or relatives	51	62
Purchase/borrow food on credit	45	73
Rely on casual labour for food	26	47
Reduce adult consumption so children can eat	23	41
Borrow from Friends/relatives	19	58
Borrow from NGOs/Grameen Bank	16	66
Have HH members eat at relatives or neighbors	11	37
Borrow from bank	4	15

More severe coping strategies were employed on a weekly basis by fewer than one-quarter of the households sampled (Table 13): Gather unusual type or amounts of wild food/hunt (23 percent); Stop sending children to school (20 percent); Skip entire day without eating (15 percent); Abnormal migration for work (13 percent); and consumption of cereal seeds saved for next planting season (12 percent).

Table 13. Severe coping strategies, practiced weekly or practiced ever

Severe coping strategies	Practiced weekly (%)	Practiced ever (%)
Gather unusual type or amounts of wild food/hunt	20	24
Stop sending children to school	20	52
Skip entire day without eating	15	28
Abnormal migration for work	13	19
Consume seeds to be saved for next planting season	12	50
Borrow from Money lenders	9	25
Begging/gleaning rice from paddy field	4	14
Pledge labour	3	11
Sold other productive assets	3	15
Sold HH assets	1	14
Sold large animals	1	9
Farmland mortgage out	0	5
Farmland lease out	0	8
Sold land	0	24

The TANGO study found that the most vulnerable households tend to employ severe coping strategies more often than other households.

The IFPRI study of urban food security found that the most common coping strategies employed by the urban poor when faced with food insecurity are to borrow money from relatives/friends and eating less. Poor households borrow money from informal sources such as friends, relatives and/or moneylenders more frequently than from a financial institution such as a bank or credit institution. Sending dependents to live with relatives elsewhere and short-term migration are not practiced frequently amongst the urban poor. Very few households reported receiving help from institutions during times of food insecurity (IFPRI, 2007).

The TANGO and IFPRI studies shed light on the struggle for food security faced by numerous low income households even prior to the impact of rising food prices. During the more recent "post-impact" period; food access and food utilization challenges have intensified, owing mostly to the higher food prices. The findings presented from the more recently collected primary data paint a picture of a worsening food security situation

for many. The section which follows explores both the magnitude of the problem, and the depth of deprivation, in greater detail.

5.4 Number of people affected, levels of deprivation, food consumption gap

Even prior to the shocks of 2007-08; a relatively large segment of Bangladesh's poorest and most food insecure households had food consumption levels well below international norms associated with food security. The Government of Bangladesh, and more specifically, the Bangladesh Bureau of Statistics (BBS) uses a calorie consumption level of 2122 kcals/person/day, as a minimum consumption threshold to define food security. This threshold is similar to the threshold of 2100 kcals/day, adopted by the international humanitarian community.

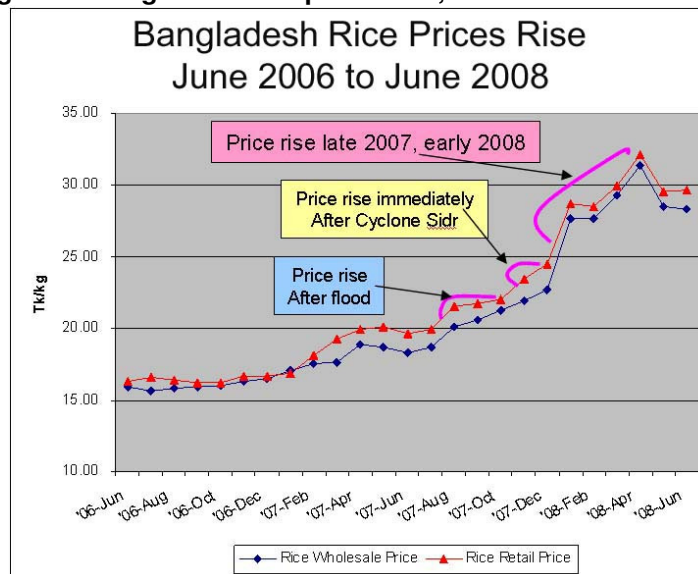
Using data from the GoB BBS HIES 2005 household income and expenditure survey; and more recent analysis by the Mission the food/calorie consumption gap of poor and food insecure households is examined for two relevant time periods:

- first for the period *before*¹³ the population was exposed to the setbacks and shocks of 2007-08 (floods, Cyclone Sidr, and the food price rise), and
- secondly for the recent period, *after*¹⁴ the exposure to these shocks.

Prior to the 2007/08 shocks an estimated 57.8 million individuals in Bangladesh were below the food consumption threshold of 2 122 kcals/person/day. This represented just over 40 percent (40.4%) of the nations' population. Within this group, an estimated 27.9 million people fell below the more severe poverty line food consumption threshold of 1 805 kcals/person/day. The latter represented about one fifth (19.5%) of the entire population. Within Bangladesh this group is commonly referred to as the "hard-core" poor.

As mentioned in earlier sections, the main food access challenge for low and even middle income is the rise in food prices. Rice and other food commodity prices have been rising since early 2007, but rose more rapidly between late 2007 and the first four months of 2008. Prices decreased moderately in May-June after the April peak. However as of late August; prices have risen again higher than the previous April peak. Figure 9 below is taken from the earlier section (4.2), with annotations added to show the timing of the rise, relative to 2007-08 shocks and setbacks:

Figure 9. Bangladesh rice prices rise, June 2006 to June 2008



Bangladesh's food insecure population has become significantly larger, as a result of the rising food prices. The severity of food insecurity has also worsened. The average food consumption caloric "gap" (the difference between minimum calories needed and actual calories consumed) has become larger, resulting in

¹³ The food price rise "before" period is roughly July-August 2007.

¹⁴ The "after" period is roughly the time of the Mission; 2nd quarter 2008.

more severe deprivation. This is a major concern for food security going forward, and presents a substantial challenge to Bangladesh's social safety net system, and the large population which it serves.

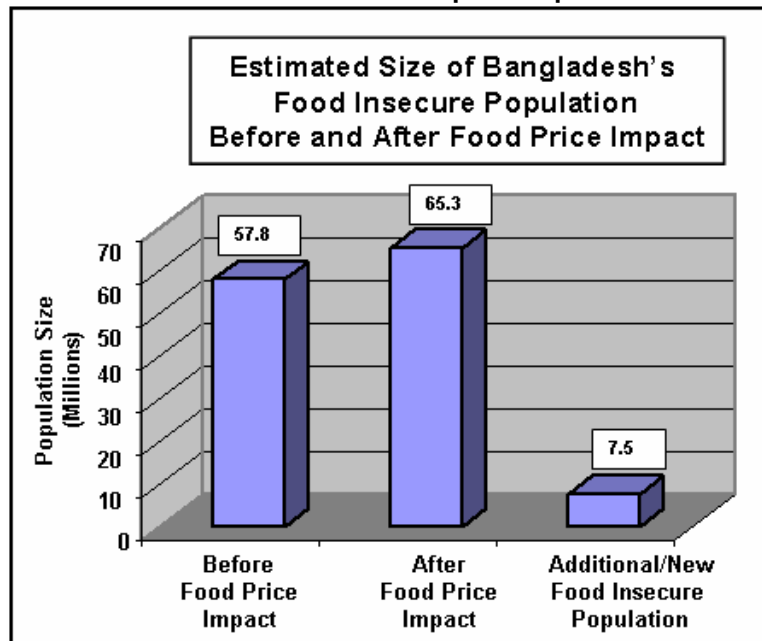
The country's food insecure population¹⁵ is now estimated to be 65.3 million; and has risen by 7.5 million (7 496 000) largely because of the impact of higher food prices¹⁶. Of particular concern is the finding that most of this growth has occurred within the ranks of the more severely food insecure; meaning those below the 1805 kcals/person/day threshold. This undernourished population has grown by 6.9 million; from 27.9 million prior to the impact to a much larger 34.7 million after the shock. In other words, more than ninety percent (92%) of the new food insecure are amongst the more severely food insecure.

As a result of rising food prices and general inflation, nearly half (45%) of the country's 145 million population is now food insecure (< 2122 kcals/person/day), and nearly 1/4th (23.9%) is understood as severely food insecure (consuming less than 1805 kcals/person/day).

The Mission's estimate of 7.5 million new food insecure could be interpreted as a conservative estimate; (i.e. unlikely to be high). A recent analysis by Bangladesh's Centre for Policy Dialogue (CPD), a Dhaka based policy oriented research institution, estimated that 8.5 percent of the population (12.3 million people), could be associated with the new poor or new food insecure (i.e. those below the poverty line threshold of < 2122 kcals/person/day), due to inflation and the rising cost of food¹⁷. Regardless of these differences, by all accounts the size of Bangladesh's food insecure population has grown substantially due to the rising cost of food and other basic essentials.

Figure 10 below shows the increase of the food insecure population before and after the impact of the food price shock:

Figure 10. Estimated size of Bangladesh's food insecure population: before and after food price impact



Source: Mission's estimates. using 2122/kcals/person/day

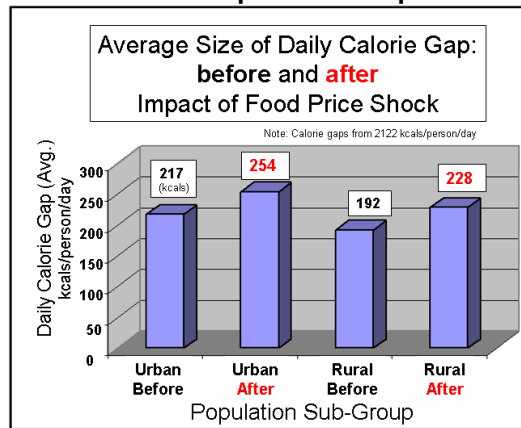
Prior to the food price rise, the average gap in food consumption for those below 2122 kcals/person/day was estimated at 201 kcals/person/day; 9 percent short of the threshold level. With the impact of higher food prices, this gap is now estimated to be 238 kcals/person/day or 11 percent short of 2122 kcals/person/day. On average, gaps are larger for the urban food insecure; 254 kcals/person/day, up from a pre shock level of 217. Gaps are smaller but still substantial for the rural food insecure; 228 kcals/person/day; up from a pre shock level of 192. Figure 11 below illustrates the changes:

¹⁵ Estimate made using the 2122 kcals/person/day threshold.

¹⁶ The Mission used both the BBS HIES 2005 data and the more recent World Bank paper "Increasing Rice Prices and Household Welfare in Bangladesh" (June 2008), as the main inputs for the analysis/estimates re: the size of the food insecure population before and after the food price shock.

¹⁷ Bangladesh Economy in FY 2007-08; An Interim Review of Macroeconomic Performance; June 4 2008. Centre for Policy Dialogue (CPD), Dhaka.

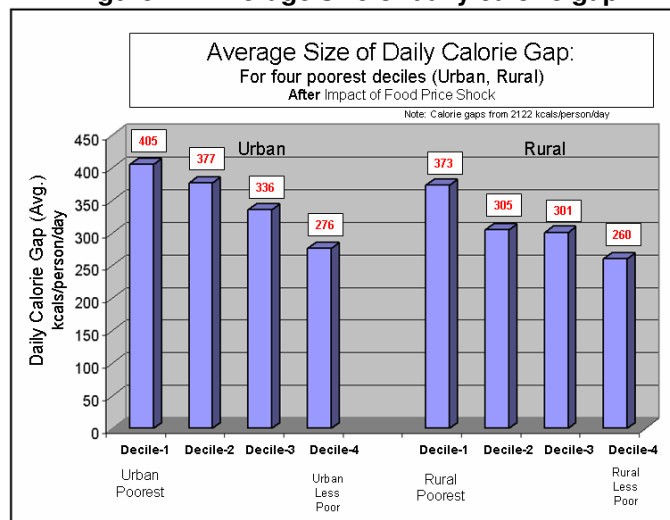
Figure 11. Average size of daily calorie gap: before and after impact of food price shock



Source: Mission's estimates.

Gaps are substantially larger than those depicted above for the poorest and most food insecure segments of society. Shortfalls were analysed for 10 groups of equal size (deciles), ranging from the poorest (i.e. the first or "lowest" decile) to the best off (10th/highest decile). Current gaps for the four lowest decile groups are shown in Figure 12 below; both for the urban and rural food insecure:

Figure 12. Average size of daily calorie gap



Source: Mission's estimates.

Many of the poorest and most food insecure households, receive assistance from the GoB's large social safety net system, comprised of numerous programmes. The following section provides greater detail on the scope, coverage, and levels of assistance provided through the public social safety nets.

5.5 Social safety nets and humanitarian response (2007-08)

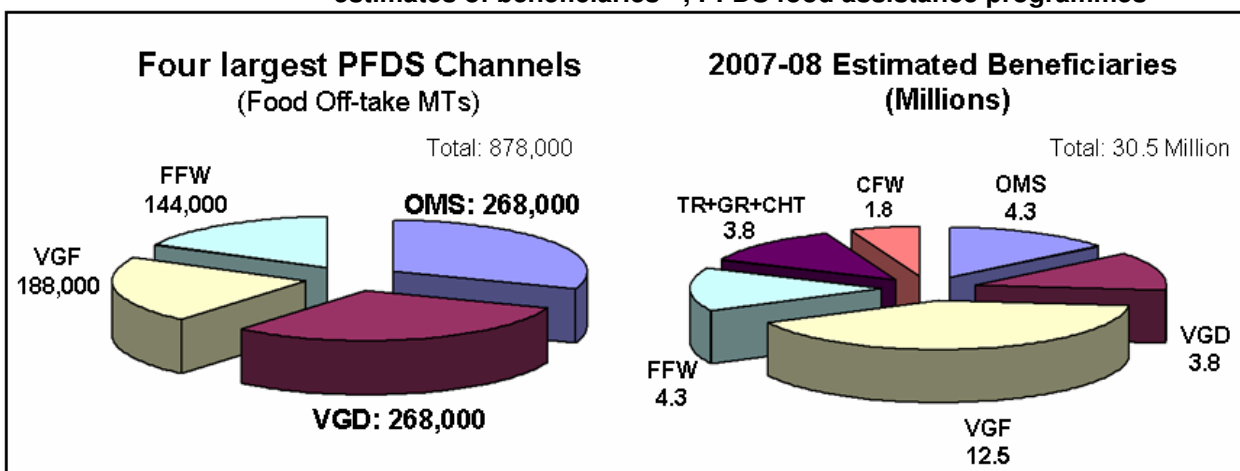
The Government of Bangladesh maintains an extensive social safety net system designed to address mainly transient food insecurity, stemming from shocks and setbacks. The Public Food Distribution System (PFDS) is the Government's main mechanism for addressing household level food access shortfalls. Public food stocks are maintained and used for both ongoing food-based development programmes and for emergency purposes during periods of acute or transitory food insecurity. Although the PFDS has numerous programmes or channels through which food assistance is provided; the bulk of assistance (approximately two-thirds of the total food distributed during fiscal year 2007-08) was provided via the following seven channels:

- OMS/Open Market Sales
- VGD/Vulnerable Group Development

- VGF/Vulnerable Group Feeding
- FFW/Food for Work
- TR/Test Relief
- GR/Gratuitous Relief
- Food Assistance for CHT Area

The Mission estimates that approximately 6.1 million households, or 30.5 million individuals (based on an average household size of 5), were receiving assistance from the above mentioned programmes during the last fiscal year of 2007-08¹⁸. This estimate was produced using GoB PFDS “off-take” data (data on tonnes of food channelled or “off-taken” through various PFDS programmes), along with information on ration sizes, and durations of assistance for each programme. In addition to the food based programmes mentioned above, the figure of 6.1 million households also includes the GoB’s relatively small 2007-08 cash for work programme. Two pie charts are shown in Figure 13 below; one showing estimated food tonnage off-take from the four largest PFDS programme channels, and another showing estimates of GoB SSN food assistance coverage (beneficiaries, including family members) during the last fiscal year (2007-08):

Figure 13. Fiscal year 2007-08 - food off-take (tonnes) from four largest PFDS channels and estimates of beneficiaries^{1/}; PFDS food assistance programmes



1/ “Beneficiaries” in this context include programme participants and their family members. The estimate of 3.8 million beneficiaries covered through Test Relief (TR), Gratuitous Relief (GR), and Chittagong Hill Tribes (CHT) is based on an estimated off-take figure of 119,186 tonnes. The total off-take figure reported by GoB is a substantially higher 209 000 tonnes. The lower figure used by the Mission is due to a lower estimate of the tonnes associated with the CHT component; based on data from WFP’s CHT Rangamati sub-office.

Estimating the number of households or people covered or receiving assistance from GoB social safety net programmes is fraught with difficulties and challenges mainly due to data availability and data reliability issues. Estimates from earlier sources suggest that far fewer households and individuals were reached by SSN programmes in previous years¹⁹.

Due to the rise in food prices and other basic essentials, the GoB has announced a significant expansion of food security oriented safety net programmes. This was highlighted by many high-level GoB officials, including the Finance Advisor, in public addresses associated with the launching of the new fiscal-year 2008-09 GoB budget.

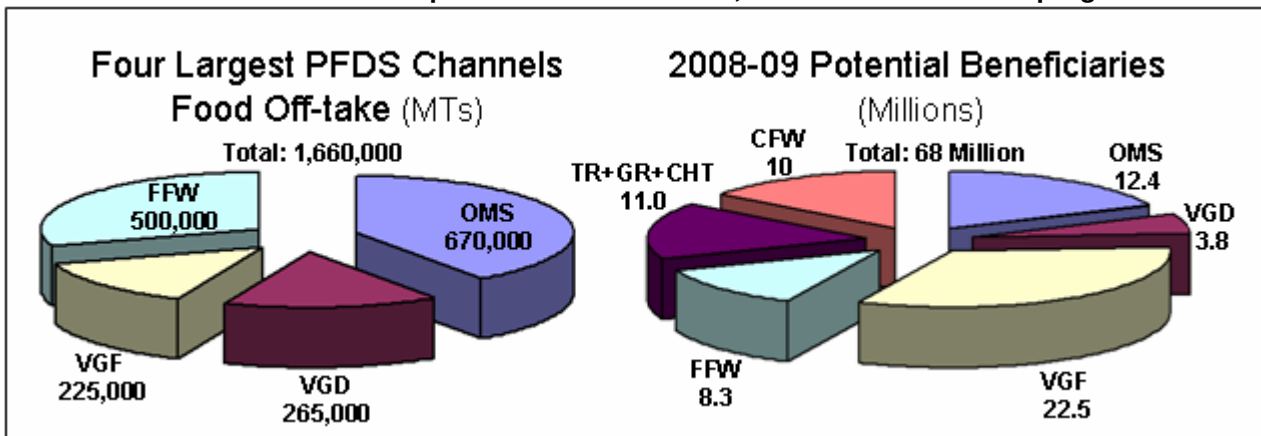
The dramatic increases in GoB safety net coverage for 2008-09 are reflected in the planned off-take numbers (tonnes channelled) through individual programmes. By far, the largest expansion is planned for OMS, with a tonnage figure of 1 350 000 tonnes for 2008-09, vs. 268 000 tonnes actually off-taken during 2007-08. In other words, more than 5 times last years’ achievement is targeted for 2008-09. Although reaching the planned OMS target would represent a remarkable achievement; for the purpose of the subsequent analysis on SSN coverage and food assistance needs, the Mission used an adjusted planning

¹⁸ The 6.1 million estimate includes a relatively small Cash for Work component; estimated at 370 000 participants. The estimates of 6.1 million households and 30.5 individuals does not attempt to account for cases where a beneficiary household is participating in more than one programme (i.e. overlap). Because of overlap the actual number of households and beneficiaries benefiting from PFDS assistance is likely to be lower than the estimates presented herein. Data pertaining to the extent of overlap across programmes was not available to the Mission and therefore it was not possible to produce “overlap adjusted” estimates.

¹⁹ The GoB BBS household income and expenditure survey from 2005 included a special module on social safety nets (SSNs) and their coverage. Results from that survey found that just over 13 percent of households (13.06 percent) received assistance from SSN programmes.

figure of 670 000 tonnes for OMS, representing a still large expansion of 2.5 times last year's levels. Taking these considerations into account, the two pie charts in Figure 14 below represent the estimated food tonnage off-take for the four largest PFDS food assistance channels as well as beneficiary coverage for the 2008-09 fiscal year:

Figure 14: Fiscal Year 2008-09 – Planned Food Off-take (tonnes) from four largest PFDS channels and estimates of potential beneficiaries^{1/}; PFDS food assistance programmes



^{1/} "Beneficiaries" in this context include programme participants and their family members.

Notable changes between this year (2008-09) and last year (2007-08), include a much larger off-take through the OMS, FFW, and VGF channels. This in turn, translates into a much larger planned beneficiary coverage through these programmes. The GoB's new "100 day employment programme" using cash for work (CFW), plans to reach 2 million households. Although the programme as such did not exist last year, the GoB did sponsor cash for work activities for a much smaller 370 000 households, or 1.8 million beneficiaries. The 2 million households (10 million beneficiaries) associated with the 100 days employment programme adds considerably to safety net coverage.

From the information provided above, the Mission estimates that the GoB's main food security assistance programmes, including the "100 days employment programme" designed to address both unemployment and food security, could reach as many as 13.6 million households, or approximately 68 million beneficiaries²⁰.

5.6 Highlights of non-Government food assistance programmes

Numerous non-Government sources are implementing food security assistance programmes, including donors, UN agencies, and NGOs. The review below focuses on a small subset of these programmes, and is not meant to be comprehensive.

USAID has a large food security assistance and disaster management programme implemented mainly²¹ through their PL 480 Title II NGOs; CARE, Save the Children SCF-US. Just over three quarters of the food imported (77 percent) is monetized²², and delivered into the GoB's PFDS food reserves. The remaining 23 percent is used for direct food distributions²³. In total, including both the CARE and SCF-US caseloads, approximately 4.8 million people are receiving assistance. CARE's project; "Strengthening Household Abilities for Responding to Development Opportunities" (SHOUHARDO), reaches approximately 400 000 households or 2 million people. The SCF-US project; "Life and Livelihood/Jibon-O-Jibika", provided assistance to approximately 2.8 million people during the US fiscal year 2007.

CARE and SCF-US are also distributing USAID funded Cyclone Sidr emergency food aid assistance with a total of approximately 18 087 tonnes of food called forward for the USA fiscal year 2008. The large majority of this monetized resource is wheat (14 880 tonnes, or 82 percent). The remainder (3 207 tonnes, or 18 percent) is directly distributed as wheat, pulses, and vegetable oil.

²⁰ The estimates of 13.6 million households and 68 million beneficiaries does not attempt to account for cases where a beneficiary household is participating in more than one programme (i.e. overlap). Because of overlap the actual number of households and beneficiaries benefiting from PFDS assistance is likely to be lower than the estimates presented, herein. Data pertaining to the extent of overlap across programmes was not available to the Mission and therefore it was not possible to produce "overlap adjusted" estimates.

²¹ WFP is also a USAID implementing partner on Cyclone Sidr emergency assistance. USAID has provided generous support to WFP's EMOP; USAID donations account for approximately 21 percent of WFP's total EMOP funding.

²² When monetized; 83 percent of the cash and freight value of the food is generated, and used as cash to fund the programmes.

²³ Main food commodities include wheat, pulses (yellow split peas) and vegetable oil.

The United Nations World Food Programme (WFP) has one of the larger food assistance programmes in the country. The programme is comprised of three components; a) the regular ongoing Country Programme (CP) which has development objectives, b) the Cyclone Sidr emergency operation (EMOP) with relief and recovery objectives, and c) assistance to the Rohingya refugees which is a protracted relief and recovery operation (PRRO). The majority of WFP's programmes provide staple foods such as rice, pulses, vegetable oil, with ration sizes that address significant portions of individual food/caloric gaps. Other WFP programmes, by design, emphasize non staple foods that are rich in micro-nutrient content. For example rations of wheat-soya-blend are provided to adolescent girls and young mothers participating in nutrition awareness programmes, or in the case of WFP's School Feeding programme, primary school aged children are provided with high energy and micro-nutrient rich biscuits, to promote attendance and education. For those programmes that are designed to address significant portions of individual food/caloric gaps, WFP is currently assisting approximately 4.7 million people (programme participants, and their family members). However, because 3.8 of the 4.7 million are beneficiaries of the GoB-WFP Vulnerable Group Development (VGD) programme, they are already accounted for within the analysis above regarding GoB SSN food assistance programmes and coverage. Therefore, leaving out the VGD beneficiaries, WFP is providing assistance to cover part of the food/calorie gaps of an estimated 900 000 individuals (4.7 million – 3.8 million = 900 000).

BRAC, Bangladesh's largest NGO has a large economic development programme with a component which explicitly targets the ultra-poor. This programme; *Challenging the Frontiers of Poverty Reduction: Targeting the Ultra Poor* (CFPR-TUP); emphasises economic development through assets transfer but also includes a monthly subsistence allowance designed to cover a portion of a households basic needs; such as food and other essentials. The subsistence allowance varies according to each participant's case, however monthly allowances tend to be in the range of BDT 300-350. As of 2007, the project had 132 500 participants²⁴, thus including household members, approximately 662 500 individuals were benefiting from assistance. Over the course of the entire project life (2007-2011), approximately 863 000 households are expected to participate.

BRAC was also a large provider of relief and rehabilitation assistance during 2007-2008. BRAC provided cash, food, and other in-kind assistance in response to both flood and cyclone victims. During the 2007-08 Cyclone Sidr response, BRAC assisted over 151 000 families (757 000 people) with a weekly food ration as well as cash assistance (BDT 200 per family)²⁵.

In total, the Mission estimates that BRAC assisted approximately 1 420 000 people via the programme activities highlighted above.

The European Commission's Delegation to Bangladesh also maintains a large food security development programme with its NGO implementing partners. ECHO, as the EC's humanitarian aid agency, is providing assistance to victims of recent natural disasters, primarily the November 2007 Cyclone Sidr.

The EC is supporting numerous projects involving both cash transfers to food insecure households as well as technical assistance projects that focus on strengthening capacity for food policy,²⁶ technology transfer for poor small scale farmers, and project management pipeline assistance. Given the focus above of this section on assistance from GoB partners that is designed to directly address food access gaps, neither the food policy nor the pipeline project are reviewed below.

The EC's two largest programmes in this context include the VGDUP project (Vulnerable Group Development for the Ultra Poor), which during 2008-09 will provide assistance to 40 000 destitute women and their dependents, or (200 000 individuals), and the REOPA project (Rural Employment Opportunity for Rural Assets), covering 22 000 women (110 000 individuals). Smaller Delegation funded projects include the *Income Food Security for Ultra Poor* project (IFSUP) which provides assistance to 4 800 poor women, (24 000 beneficiaries), and a fisheries and aquaculture enterprise development project that assists a further 3 500 households (17 300 individuals).

ECHO has been one of the main donors providing relief and recovery assistance in response to both the 2007 Monsoon floods and Cyclone Sidr. ECHO partners involved in the flood relief and recovery response included UN agencies, IFRC and the Bangladesh Red Crescent Society (BDRCS) and numerous NGOs²⁷. In

²⁴ Source: BRAC Annual Report, 2007.

²⁵ Ibid.

²⁶ Both the EC delegation to Bangladesh and USAID are major donors to the FAO NFPCSP (National Food Policy Capacity Strengthening) project. The agricultural technology transfer project is known as FOSHOL; Food Security for Sustainable Household Livelihoods, while the pipeline project is known as the Pipeline Food Security Project.

²⁷ ECHO's flood response partners included Concern Worldwide, Islamic Relief, ActionAid, Christian-Aid, CARE-UK, and Handicap International.

total ECHO's flood response assisted approximately 69 000 households (345 000 people) during the period July through September 2007²⁸.

ECHO was also one of the largest donors responding to Cyclone Sidr, and provided cash, food, and other in kind assistance through a large number of implementing partners²⁹. Most of food security support was channelled through WFP, with ECHO funds supporting 2.2 million beneficiaries. ECHO also relied extensively on BDRCS and numerous NGO partners³⁰. Cumulatively, at least 460 000 Cyclone victims are believed to have received food assistance through ECHO NGO's partners³¹.

In total, considering the details of the programmes outlined above, the Mission estimates that approximately 351 000³² people are receiving assistance through the EC's regular food security programmes, while just over 3 million received ECHO funded flood and cyclone relief and recovery assistance.

DFID's Chars Livelihoods Programme (CLP) focuses on improving the livelihoods of some of the poorest households in the Northern riverine/Chars areas of the country and has a longer term (2013) objective of lifting 6 million people out of poverty³³. Monga; a phenomenon associated with seasonal hunger during the months of September November and concentrated in the North of the country, is prevalent within the project area. CLP employment generation activities address the transient food insecurity associated with Monga, as well as disaster risk reduction through investment in household assets.

CLP includes various sub-project components that focus on infrastructure, livelihoods, social development, and enterprise development. Of these various components, considering the focus herein on transient and chronic food insecurity only the infrastructure and livelihoods elements are reviewed.

CLP's Infrastructure and Employment Programme (IEP), as of end May 2008 had provided assistance to 50 000 of the poorest households (250 000 people) living within the Chars region. An additional safety net grant (BDT 175/month) was provided to an additional 3 100 households (15 500 people) to assist Monga affected households unable to participate in the cash for work projects because of the lack of an able bodied person within the household.

CLP's livelihoods component, for the period July 2007-May 2008, had assisted nearly 18 900 households (94 000 people) with asset transfers (mainly livestock), and a monthly stipend of BDT 300 designed to support food security by facilitating food and other essential purchases on the market. Other aspects of livelihoods assistance included training in homestead gardening and livestock vaccination.

In total, considering all CLP components reviewed above, the Mission estimates that approximately 360 000 people received assistance during the July 2007–May 2008 period³⁴.

Many other NGOs have also been active in providing food aid and food security assistance, however relative to the larger programmes highlighted above, beneficiary caseloads of these other programmes are relatively small. Many of the national NGOs, for example BRAC, Grameen, and Proshika, are operating numerous microfinance and micro-enterprise programmes. Since these programmes have a greater emphasis on poverty reduction through facilitating access to credit, as opposed to the focus herein (i.e. facilitating access to food via direct cash/or food transfers, employment generation etc...) the microfinance and microenterprise programmes are not included in this review.

Estimating the total number of individuals receiving assistance, through non-Government programmes that have an explicit emphasis on facilitating food access, is problematic due to the large number of organisations involved, and more specifically because of data availability constraints. Excluding relief and recovery

²⁸ Source WFP/LCG DER Members Response Activity Matrix as of 19 September 2007. The estimate of 69 000 households and 345 000 people is likely to underestimate the total number of flood victims provided food security assistance by ECHO due to data availability constraints. According to the UN OCHA Financial Tracking System (FTS) database as of 5 August 2008; ECHO had committed a total of nearly USD 8.2 million for the 2007 Monsoon flood response.

²⁹ ECHO Cyclone Sidr implementing partner agencies included WFP, Oxfam-GB, ActionAid, Islam Relief, Concern Worldwide, IFRC/BDRCS, ACF-France, CARE-UK, Danish Church Aid, SCF-UK, Caritas, Muslim Aid, and Christian Aid. Source: OCHA Financial Tracking System database, as of 5 August 2008.

³⁰ ECHO's NGO partners during the Cyclone Sidr response included Caritas, Oxfam, Islamic Relief, Concern, ActionAid, Handicap International, and Christian Aid.

³¹ Source for the 460 000 estimate is the Bangladesh Food Cluster data; December-January 2008 (WFP).

³² The estimate of 351 000 is based on the sum of the individual programmes; VGDUP (200 000), REOPA (110 000), IFSUP (24 000), the fisheries and aquaculture project (17,300), sum of the four = 351,250; or 351 000 rounded to the nearest thousand.

³³ All information reported above pertaining to DFID's CLP project were obtained from the project website at <http://www.clp-bangladesh.org>

³⁴ The estimate of 360 000 is based on the sum of individual programmes; IEP (265 500), + Livelihoods (94 000), = 359 500 or approximately 360 000 rounded.

assistance, the Mission estimates that approximately 6.3 million people were receiving assistance through the non-Government channels described above. Under the assumption that these programmes represent the large majority of non-Government assistance (between two thirds to three quarters), the Mission estimates that as many as 8.1 million people could be receiving regular programme assistance designed to address food access gaps from non-Government channels³⁵. The 8.1 million number represents just over 12 percent (12.4%) of the estimated 65.3 million food insecure population.

5.7 Food security SSN coverage; adjusting for leakage-related inclusion errors

The estimates above of approximately 68 million people potentially reached via the GoB SSN 2008-09 expanded coverage, and an additional 8.1 million likely to receive assistance through non-Government programmes, suggest that a maximum of 76.1 million people could receive assistance if plans and targets were to be reached. This figure is notably higher than the earlier estimate of 65.3 million currently believed to be consuming less than 2 122 kcals/person/day; i.e. the food insecure population. In an ideal world of 100 percent targeting efficiency (i.e. all whom receive assistance are food insecure), Bangladesh's food insecure population would all at least be receiving some amount of assistance. For a more realistic assessment of how many food insecure are likely to be covered both by Government and non-Government channels, it is necessary to factor in considerations related to inclusion based targeting errors. Such errors occur when assistance is received by someone not meeting the pre-defined targeting/qualification criteria. Criteria are generally closely related to programme objectives; and within this context the implied objective of these programmes is to address food insecurity. By extension, food secure individuals (i.e. those above the 2 122 kcals/per capita/day threshold) receiving assistance would be understood as cases contributing to leakage related inclusion errors.

As is true with nearly all safety net programmes around the world, leakages and targeting errors are known to be significant, and Bangladesh is no exception. Estimates of leakages in Bangladesh have been analysed, and commented on in past studies³⁶. Unfortunately the range in estimates is very broad, and figures vary widely across sources. Also much of the literature on leakages focuses more on leakages related to smaller rations received by beneficiaries (vs. larger entitlements), as opposed to leakages related to inclusion errors. Current or even recent estimates of inclusion errors for existing ongoing programmes are scarce. For the GoB SSN food assistance programmes reviewed above, Mission members first looked at VGD related inclusion errors, virtually the only programme reviewed above, for which data was available.

The World Bank's 2006 study and assessment of safety nets in Bangladesh cites an estimate that "27 percent of VGD beneficiaries are not poor"³⁷. IFPRI's 2007 study on the Relative Efficacy of Food and Cash Transfers estimated the distribution of VGD programme participant households using capita expenditure deciles based on the BBS 2005 HIES data. The IFPRI findings showed approximately 74% of VGD households associated with the lowest four deciles; i.e. those deciles that are often associated with poverty and food insecurity. By extension; approximately 26% of VGD participants were not amongst the poorest; thus 26% can be inferred from the IFPRI findings as an approximate inclusion error estimate. Given the considerable efforts by both GoB and WFP to improve VGD targeting since the publication of these earlier studies; the Mission used a slightly lower 24% inclusion error estimate for the VGD programme³⁸.

Inclusion error estimates were not available for other food assistance programmes reviewed above. However, past data pertaining to overall estimates of targeting effectiveness were available not only for VGD, but also for VGF as well as for Test Relief (TR)³⁹. These measures of targeting effectiveness examined the probability of participation in the three fore-mentioned programmes, by income groups using 5 quintiles; with 1 quintile representing the poorest and 5 quintile representing the best off. The measures of targeting effectiveness were not dramatically different across the three programmes, however, VGD's targeting effectiveness scores were somewhat higher than both VGF and Test Relief. Using the VGD estimate of 24%

³⁵ Estimate above of 8.1 million, based on assumption that USAID, WFP, BRAC, EC Delegation, and DFID's CLP programmes represents 70 percent of the total (or 5.7 million), while all others represent 30 percent (2.4 million). Thus the total estimate for non-Government channels is 8.1 million (5.7 + 2.4). The WFP input to this calculation does not include the 3.8 million people receiving assistance through VGD, because this is already accounted for in the earlier estimates of GoB SSN coverage.

³⁶ The International Food Policy Research Institute (IFPRI) has published extensively on the issue of leakages; first in 2004 (Food Aid Distribution in Bangladesh: Leakage and Operational Performance), and more recently in 2007, (Relative Efficacy of Food and Cash Transfers in Improving Food Security and Livelihoods of the Ultra Poor in Bangladesh). The World Bank has also addressed the leakages and targeting errors issues in a variety of publications, including Food Assistance Programmes in Bangladesh (2004), and Social Safety Nets in Bangladesh: An Assessment (2006).

³⁷ World Bank; Social Safety Nets in Bangladesh: An Assessment (2006).

³⁸ Most of WFP's efforts from 2005-2007 to improve the efficiency and effectiveness of VGD and other SSN programmes were funded through the DFID Partnership Agreement, a capacity building project. Efforts focused primarily on three areas: geographic targeting, beneficiary selection, and monitoring and evaluation.

³⁹ Social Protection and the Poor in Bangladesh, Quaiser Khan, et al, from a presentation given by the World Bank at a BRAC sponsored Conference on "What Works for the Poorest"; December 3-5 2006; Dhaka Bangladesh.

inclusion error, together with the data on targeting effectiveness of VGF and TR; a scaling procedure was done to derive an inclusion error estimate of 27% for VGF and TR. This 27 percent estimate was also applied to the remaining GoB programmes reviewed earlier.

Applying these inclusion error estimates to the earlier figures of both GoB and non GoB SSN food assistance programmes and coverage for 2008-09, the Mission estimates that of the approximately 76.1 million⁴⁰ people likely to receive assistance in 2008-09; approximately 56 million could be considered food insecure⁴¹. By extension this implies that of the earlier 65.3 million estimate of the current food insecure population, approximately 9.3 million (65.3 minus 56) food insecure people are unlikely to receive assistance.

Estimating food security assistance needs for 2008-09

For the 9.3 million food insecure population outside of current social safety net coverage; the Mission estimates that approximately 336 000 tonnes⁴² of food would be required for fiscal year 2008-09 to meet minimum consumption needs at 2122 kcals/person/day. The estimate of 336 000 tonnes factors in a 24 percent targeting inclusion error, as well as a 15 percent loss for ration size leakages. Leakages related to smaller rations vs. planned entitlements can occur for a number of reasons. Causes can include discrepancies between actual resources available at the time of distribution (vs. resources planned), delays in the delivery process related to procurement, transport or project implementation, irregularities in milling, and inaccuracies in weighing systems during distributions. Reported past causes of ration related leakages also include occasional involuntary sharing with non beneficiaries said to be equally needy, or situations where transport related carrying costs (i.e. the costs of transporting the food from local storage depots to distribution sites) exceed planned costs, leading to the sale of some of the food to cover actual carrying costs. Ration related leakages will be much lower for food assistance programmes that are better planned, implemented and monitored. For example; WFP's VGD monitoring findings from its own internal M&E system showed post delivery losses declining from 5.94 percent in 2004, to 1.14 percent in 2007. (Source: WFP Bangladesh 2007 Monitoring Report, January-December). Delivering rations in sealed packets is also an effective means for reducing ration related leakages. VGD beneficiaries receiving fortified wheat flour (Ata) in sealed packets reported receiving 100 percent of their ration entitlement during 2007⁴³.

The majority of the food insecure population are likely to receive some assistance through GoB or non GoB SSN programmes. Even with assistance, most participants within these programmes will remain food insecure because of limited resources, and inadequate levels of assistance. This depends on the extent or depth of beneficiaries food insecurity prior to assistance and secondly on the caloric transfer value of the assistance itself, and its' contribution to addressing consumption gaps. For calculating food assistance needs, transfer values are particularly important because one needs to know whether the transfer value of assistance is sufficient or insufficient to cover existing gaps and needs. To better understand food assistance needs, within the context of planned assistance, the Mission used estimated transfer values associated with the expanded GoB SSN 2008-09 food assistance programmes, taking into account ration sizes, duration of assistance, and additional beneficiaries covered.

Transfer value of food assistance relative to per capita caloric gaps

One of the few recent sources that sheds light on the transfer value of food security assistance programmes is IFPRI's 2007 *Relative Efficacy of Food and Cash Transfers*⁴⁴. This source was used as a key input for the food assistance needs analysis. Of the main GoB SSN food assistance programmes reviewed earlier, only VGD was reviewed in the IFPRI study. The estimated transfer value of VGD from the IFPRI findings was 164 kcals/person/day⁴⁵. By comparing the planned 2008/09 VGD nominal off-take rations w/ the planned rations of other programmes, and using the 164 kcals/person/day value as a reference point, the Mission

⁴⁰ The 76.1 million estimate is the combined sum of 68 million (GoB programme beneficiaries) and 8.1 million (non GoB programme beneficiaries).

⁴¹ The 67.6 million figure above is comprised of 60.7 million (GoB) + 6.9 million (non-GoB). The inclusion error leakage figure for non GoB programmes used was 15 percent, i.e. w/ the assumption of being similar to VGD in targeting efficiency.

⁴² The 336 000 tonnes estimate incorporates a 24 percent targeting inclusion error, as well as a 15 percent ration leakage. The 15 percent ration leakage estimate will be high for those food assistance programmes that are better planned, implemented and monitored. For example; WFP's VGD monitoring findings from its own internal M&E system showed post delivery losses declining from 5.94 percent in 2004, to 1.14 percent in 2007. (Source: WFP Bangladesh 2007 Monitoring Report, January-December).

⁴³ WFP Bangladesh 2007 Monitoring Report, January-December.

⁴⁴ IFPRI Relative Efficacy of Food and Cash Transfers in Improving Food Security and Livelihoods of the Ultra Poor in Bangladesh (2007).

⁴⁵ Ibid IFPRI (2007). The study actually looked at two sub-components of VGD; IGVGD with a transfer value of 194, and FSVGD with a transfer value of 247. Because FSVGD has been phased out and because the current VGD is the same/similar to IGVGD, the 194 kcals/person/day is used.

produced estimates of transfer values for the other GoB SSN programmes, as well as an estimate for then non GoB food assistance programmes.

A number of important points are worth highlighting with regards to this analysis. First, the reference VGD transfer value from the earlier 2006 IFPRI study had to be adjusted to account for the fact that a greater quantity of food is planned for off-take/distribution in 2008-09, as compared to the off-take values for the relevant year of the earlier IFPRI study (2005-06)⁴⁶. Since the VGD caseload or number of beneficiaries has remained constant across years; the 2008-09 nominal kg per capita off-take value, is higher than 2005-06, and thus the per capita kcals transfer has been adjusted slightly upwards to a new transfer value of 177 kcals/capita/day.

Secondly, relative to the transfer value of other programmes, the estimated OMS transfer value is very small (23 kcals/capita/day). This is because unlike all other food assistance programmes reviewed, OMS is a unique case. Participants or purchasers of OMS food actually pay for the commodity, at a modestly discounted price compared to the actual market value. For example, at the time of the Mission rice purchased at an OMS market was selling for BDT 25/kg, whereas the same rice on the normal market without the discount was selling for BDT 30/kg. Thus the real or actual “free” transfer value of the transaction is BDT 5. Had the OMS rice been distributed freely at no cost to the participant/purchaser, its’ transfer value would have been a much higher 135 kcals/person/day, as opposed to the adjusted figure of 23 kcals/capita/day.

Thirdly, since the analysis of transfer values is done using food related units (i.e. kcals/person/day, or kgs., or tonnes), transfer values for cash based programmes, such as the GoB’s 100 days employment programme; had to be converted into food based units. The value of the assistance in monetary units were thus converted into food units, by estimating how much food could be purchased on the market with the income gained, using an assumption that approximately 75 percent of the income would be spent of food.

Lastly, data on the value of assistance or transfers for most of the non-Government programmes reviewed was not available. One important exception to this was the Infrastructure & Employment Programme (IEP) component within DFID’s Chars Livelihood Programme (CLP). Helen Keller International (HKI) Bangladesh was recently hired by DFID to evaluate the nutritional impact of IEP programme participation⁴⁷. HKI found that “per capita rice consumption/week ... increased among the CFW-participant households” from 2.6 kg to 3.2 kg. Expressed in daily per capita caloric terms this increase is approximately 312 kcals/capita/day. By comparison, earlier IFPRI findings on the caloric transfer value of another well know cash-for-work intervention (the Rural Maintenance Programme/RMP) showed an increase of 271 kcals/person/day for programme participants⁴⁸. Many of the non-Government food assistance programmes reviewed earlier involve cash-for-work, or asset transfers. For the purpose of having a rough transfer value estimate for non-Government assistance programmes in 2008-09 the Mission used a value of 292 kcals/person/day; the average of the two (271+312) findings above.

As mentioned earlier, the Mission estimated that currently average gaps are 238 kcals/cap/day for the food insecure population in general, with breakdowns of 254 for the urban food insecure and 228 for the rural food insecure. The urban gap of 254 was used to approximate the gap of an OMS purchaser during 2008-09, and similarly the rural gap of 228 was used to approximate the gap of all other programme beneficiaries. OMS operates primarily in urban areas, while all other programmes are mostly implemented in rural locations. Using the transfer value estimates of the planned 2008-09 assistance, the Mission calculated gap related needs after assistance. Needs are expressed first as rice equivalent kg/capita, which are then multiplied by the number of programme participants, with final needs expressed using units of tonnes.

Table 14 below provides the estimated 2008-09 daily per capita transfer value⁴⁹ of the various programmes; and the average daily per capita calorie gaps after assistance. Also included in the table are estimates of the average yearly per capita gap for beneficiaries expressed in kg rice equivalent, the estimated number of planned beneficiaries, and finally the tonnes of food assistance that would be needed to bring these populations up to the minimum food security level of 2122 kcals/person/day. It is important to emphasize that

⁴⁶ Although the IFPRI study was published in 2007, data collection for the survey occurred in July 2006. Survey respondents reported how much food they received through VGD for the six month period prior to the survey. Thus the relevant GoB PFDS off-take year was 2005-06.

⁴⁷ HKI Bangladesh (2008), Measuring change in nutritional status and coping strategies in response to monga of the Chars Livelihoods Programme (CLP) cash-for-work-intervention.

⁴⁸ IFPRI Relative Efficacy of Food and Cash Transfers in Improving Food Security and Livelihoods of the Ultra Poor in Bangladesh (2007).

⁴⁹ Transfer values presented in the table are not directly comparable to each other due to the differing durations of assistance across programmes.

although needs are expressed using units of tonnes rice equivalent, these needs should be addressed using various modes of assistance, such as cash, food, or even food coupons/vouchers. Findings are presented using tonnes as a matter of convenience; due to the inherent nature of the analysis which is built on a food consumption based caloric gap approach.

Table 14. Food security assistance needs within SSN programmes (2008-09)

Programme	Amount of tonnes needed to reach 2122/kcals/cap/day					
	Gap before assistance (kcals/cap/day)	Transfer value ^{1/} (2008-09) (kcals/cap/day)	Gap after assistance (kcals/cap/day)	Gap after assistance (kg/cap/year)	Planned beneficiaries ^{2/} (millions)	Needs to reach 2122/kcals/cap/day ('000 tonnes)
OMS	254	23	231	23	12.4	288 000
VGD	228	177	51	5	3.8	19 000
VGF	228	25	203	20	22.5	458 000
FFW	228	150	78	8	8.3	66 000
TR/GR/HT	228	77	151	15	11.0	166 000
CFW-GoB	228	107	121	12	10.0	121 000
Non-GoB programmes	228	292	+64 (no gap)	n/a	8.1	n/a
Total					76.1	1 118 000

^{1/} Transfer values in the table reflect differing durations of assistance across programmes, and therefore are not directly comparable.

^{2/} Beneficiaries refer to programme participants and their family members. The total of 76.1 million includes those likely to receive assistance; including recipients associated with inclusion based targeting errors.

Table 14 above; and the 1.118 million tonnes total figure refers to the food equivalent resource that would be needed to bring those within SSN food assistance programme coverage up to the 2122 kcals/cap/day level. It does not include the needs of the food insecure population outside of SSN coverage; i.e. the 336 000 tonnes for 9.3 million people as presented earlier. Thus the total needs to bring Bangladesh's entire food insecure population to the 2 122 kcals/cap/day level is estimated at 1.454 million tonnes.

The Mission also examined needs from the perspective of resources required to address only new needs attributable to the food price rise shock. From the earlier analysis, an estimated 65.3 million people are food insecure and affected. The calculated gap prior to the shock was 201 kcals/person/day, and 238 subsequent to the shock. Thus, on average, an additional 37 kcals/day are required by the food insecure and affected population. An estimated 367 000⁵⁰ tonnes would be needed to address these "shock only" related needs.

6. **RECOMMENDATIONS**

6.1 **Recommendations on agricultural policies**

- In view of the widespread shortages of **fertilizers** in many districts at Boro planting time, practical and workable solutions need to be found to ensure that adequate supplies of all major fertilizers are available, on time in all parts of the country for the coming transplanted Aman season as well as the following Boro season. Despite the steep increases in the price of all fertilizers, sufficient supplies must be procured, advertized and distributed in the most efficient way so that future crop yields can be maintained, or better, increased through improved and balanced usage of fertilizers. Numbers of fertilizer stores/outlets under each dealer should be increased from 4 to 8 to ease the options that would reduce the need for farmers to queue for supplies. Under the proposed system farmers could get fertilizer on credit also. The private sector should be encouraged to build adequate stocks of P and K fertilizers such that there is no scarcity or perception of scarcity. A basic stock of 30 percent of national requirements for each major fertilizer is recommended.
- There is currently an imbalance in the use of fertilizers, with highly subsidized Urea being over-used and Phosphate and Potash being under-used. This imbalance needs to be addressed effectively (e.g. decrease the subsidy on Urea and apply the money saved to P and K fertilizers) in order for crops to receive the correct amount of nutrients at the right time and in the correct amounts. Given the international fertilizer market situation, state-to-state trade currently being promoted by the Government seems to be a good initiative in the short run. Sustainability and profitability of domestic production as well as liberalization of distribution are issues for the medium term.
- As Phosphate does not move in the soil, the practice of applying this expensive input by broadcasting is wasteful. Phosphate should be placed in the root zone.

⁵⁰ The 367 000 tonnes figure takes into account 24 percent inclusion errors in targeting and 15 percent ration related leakages.

- The Government should initiate national and international dialogue on the accessibility of fertilizers. Sufficient and timely availability of fertilizers are a necessity if normal agricultural production is to be maintained.
- Soil organic matter levels are decreasing due to removal of most crop residues for fuel and animal feed. **Animal manures** are also being used for fuel, further depleting soil organic matter levels. The introduction of Conservation Agriculture (minimum tillage, permanent soil cover and the use of appropriate rotations), which has already shown its efficacy in Bangladesh, should be tested and demonstrated at research stations and on farms across the country.
- More resources need to be invested in **seeds** to develop superior rice varieties for specific environments, including hybrids, salt-tolerant varieties high-value specialty rice varieties for export and possibly higher yielding types of floating rice. The possibility of using GMO techniques to develop salt, drought and submergence-tolerant varieties of rice and other crops needs to be properly investigated through public sector institutions and the appropriate policy implemented. Farmers should also be encouraged to use certified seed in order to produce higher yields from their very small plots. Seed quality inspection by the Government needs to be improved.
- While improvements in the supply of electricity for **irrigation** has been improved in recent years, large areas still do not have an adequate supply, with six hours/day instead of a promised 10 hours/day. This problem needs to be addressed as a priority, particularly in those districts in the south of the country that suffered electricity shortages this season.
- Agricultural **credit** for farmers to buy the best seeds, fertilizers and other inputs is not timely and easily available to many farmers and is very expensive in some areas. Some means must be found to address this problem effectively; and provide farmer-centred credit on a sustainable basis. Credit accessibility should be at the door steps of the farmers at low interest rates preferably by private bankers without collateral.
- There is a lack of **farmers' organization**. Farmers, particularly marginal farmers and sharecroppers are not organized into an effective economic lobby to look after their economic interests and so have to sell at the lowest prices at harvest. Effective mechanisms to address this problem need to be introduced. This is especially necessary on new lands in the south and there is already a successful donor-funded and Government-supported programme which provides title to land to women farmers in these areas. This needs to be expanded.
- Bangladesh has a major shortage of **pulses**. Incentives aimed at increasing pulse crop production should be expanded, not only for nutritional reasons but also because pulse crops add nitrogen to the soil at no cost.
- **Micronutrient** deficiencies are widespread in Bangladesh in the human population, in crops and in livestock. Economic ways of addressing these deficiencies need to be investigated as a priority, both for improving crop yield and also improving the nutritional value of the crops grown for the human and livestock population.
- Potato **storage** and the electrical power for refrigeration needs to match production of this crop and the most economic means must be found to fund this essential infrastructure. This will assist in minimizing the losses that have been reported.
- The Government should consider support for a regional food bank, possibly under the auspices of SAARC.
- The high dependency on agriculture and on ever-smaller parcels of land, combined with population growth of 1.48 percent is unsustainable in the longer term. Urbanization is already occurring but it needs to be planned. An orderly move to the cities is required, combined with a major effort to provide technical skills to make the urban population capable of **employment** in high technology manufacturing and other skills that are in international demand.
- Gainful **employment** is needed by the rural poor and this labour could be directed towards infrastructure improvements including maintenance and repair of irrigation infrastructure, river bank protection works in their home areas and development of new lands in the south.
- More needs to be spent to improve the working conditions of **extension staff** and to increase staff numbers to the appropriate level. The use of extension staff for administration of subsidy schemes and for the management of fertilizer distribution is not recommended as it takes them away from their real job of raising agricultural productivity and incomes.
- There should be better coordination at all levels in the gathering and sorting of agricultural statistics.

6.2 **Recommendations on food security assistance**

- The Mission recommends a significant increase in food security safety net assistance programmes to support the GoB's already planned SSN expansion. Additional assistance would effectively allow currently food insecure households to stop, or reduce their reliance on negative coping strategies such as decreasing diet diversity, taking smaller food portions, reducing the number of daily meals, taking on unmanageable levels of debt, and spending inordinate amounts of household income on food purchases.
- The mode of assistance and transfers used (i.e. food, cash, vouchers) should take into account the following factors:
 - The functioning of the markets,
 - Past analysis which suggests that poorest households, and women in particular, prefer food over cash partly because of intra-household dynamics regarding the control over the utilization of household resources (IFPRI 2007)⁵¹,
 - Speed and efficiency of the transfer,
 - Concerns regarding food warehouse storage capacity, and space limitations⁵²,
 - Concerns regarding compromised diet diversity, and micronutrient related malnutrition. Food interventions that distribute fortified food such as Ata raises micronutrient intake levels, and thus should help to address these concerns.

The Mission recommends that in-kind food assistance transfers should, to the greatest extent possible, include the food commodities that are fortified with micro-nutrients. Whole wheat flour (Ata) distributions should be scaled-up dramatically, along with additional support to millers if required. Including a greater percentage share of micro-nutrient rich food in the food aid basket will promote a more balanced diet and counter the known tendency of poor and food insecure households to compromise diet diversity during times of high food prices. Other food commodities such as pulses, high in protein, and vegetable oil, enriched with vitamin A should also be encouraged. Greater use of micro-nutrient-powder (i.e. sprinkles) as a supplement for special groups vulnerable to malnutrition (young children aged 6 to 59 months, and pregnant and lactating women) should be given serious consideration.

Technical assistance projects promoting the ownership and cultivation of homestead vegetable gardens should be encouraged. Organisations within Bangladesh such as Helen Keller International have a wealth of experience implementing homestead garden projects which have proven to be successful. The gardens as assets are valued by households because of their dual utilization function; on the one hand they promote healthier diets as households consume their own vegetable production, and secondly households have a flexible option to sell vegetables on local markets if and when supplementary household income is needed.

Food rations should be packaged and delivered whenever possible in sealed and pre-weighed packets so as to minimize leakage related losses. Monitoring data from the GoB and WFP's Vulnerable Group Development (VGD) programme have shown near zero losses for Ata delivered in such packets; providing empirical evidence of the utility of this best practice⁵³.

Food security assistance programmes that promote self reliance and which support a households' ability to cope with future shocks should be encouraged. Although significant segments of the food insecure population such as children, pregnant and lactating women, elderly, disabled etc. will require unconditional assistance; programmes that involve labor inputs from able bodied individuals have an important role to play.

More specifically; programmes such as food for work and cash for work have a dual advantage in that they not only encourage self reliance but they often result in the creation or maintenance of valuable assets (i.e.

⁵¹ IFPRI's Relative Efficacy of Food and Cash Transfers in Improving Food Security and Livelihoods of the Ultra Poor in Bangladesh (2007); p. 50. Findings from the IFPRI study note: "The results suggest that, as income increases, beneficiary preference for food declines, indicating that the poorest households prefer food only as the transfer. Conversely, relatively better-off beneficiaries tend to prefer only cash. These results are statistically significant".

⁵² Concerns have recently been expressed regarding GoB PFDS warehouse space limitations and storage capacity. Factors that appear to be contributing to these concerns include; the expansion of food imports, a larger domestic food procurement drive by the GoB, and the still outstanding transfer of a large portion (roughly half) of the Government of India's earmarked 500 000 tonnes of rice for Bangladesh import, at a preferential below market rate.

⁵³ WFP Bangladesh 2007 Monitoring Report Jan.-Dec. The problem of ration related leakage was also highlighted in the World Bank's 2006 publication Social Safety Nets in Bangladesh, An Assessment. The study noted: "new procedures are needed for packing and distributing food grains through pre-packaged containers. The procedures would make it more difficult for ad hoc amounts to be stolen and misappropriated and make it easier for recipients to know they are receiving their exact entitlements.

roads, embankments, raised homestead grounds, water sources protected) thereby making a meaningful contribution to disaster risk reduction.

The existence of numerous public works programmes that operate during normal (i.e. non disaster) times provides valuable opportunities for flexibly scaling up such projects immediately prior to or after new disasters so as to promote household coping. For example, in response to the 2007 floods DFID successfully utilized its Infrastructure and Employment Programme (IEP) component of the Chars Livelihoods Programme (CLP), as an effective mechanism to channel new assistance to flood affected families. This type of opportunistic flexible response practice should be promoted as a best practice worthy of replication in the future.

Areas that are less likely to benefit from the recent bumper Boro harvest should be given additional consideration for the targeting of in kind food assistance. Districts where the Boro harvest is either limited or negligible include Barguna, Jhalokati, Patuakhali, Pirojpur, Bandarban, Khagarachari, Rangamati, Bagerhat, Khulna, and Kushtia.

All food assistance programmes should seek to maximize their targeting efficiency by taking full advantage of relevant data and information that can contribute to better geographic targeting. In addition to the pre food price crisis poverty maps; data showing differences in food prices at sub-national levels, or monitoring data showing the actual resources transferred/off-taken through ongoing PFDS programme channels, should be used for better geographic targeting, and if necessary for changing operational plans if and when required. Key inputs for this type of analysis could include; i.e. the updated local level poverty maps from the World Bank, BBS, WFP collaboration; district or sub-district level food price data⁵⁴, and monitoring data on PFDS off-take from the GoB MOFDM's Directorate of Food.

Given concerns about growing urban food insecurity, and the Missions' earlier findings that daily per capita calorie gaps are comparatively larger in urban areas, it seems likely that cities will receive greater levels of assistance as compared to the past. Providers of such assistance should take advantage of the growing knowledgebase on urban food insecurity in order to plan and target interventions for maximum effectiveness. For example; the IFPRI, WFP, BBS study of Household Food Security in Urban Slum Areas of Bangladesh (2006) provides detailed profiles of urban slum populations and includes 24 thematic maps showing variables such as calorie consumption sufficiency, diet diversity, household food insecurity access scores, and other related dimensions of food insecurity and poverty. Such profiles and maps could be useful for the planning and targeting of new interventions designed to address urban food insecurity.

Better information management and mapping is needed for both GoB and non government food assistance programmes. Programme managers should increase their efforts related to data and information exchange. Maps that highlight the operational coverage of these programmes, or databases that provide details on project areas, numbers of households assisted, or even muster rolls of beneficiary names should be shared so as to minimize the risk of overlap and in-efficient resource allocation. Due to resource constraints, many of these programmes assist a relatively small percentage of the poor and food insecure population residing within the local administrative area where the project is implemented. Nevertheless, situations where individuals or households receive benefits from more than one programme, with project managers unaware of the overlap, certainly exist. The World Bank's 2006 publication; *Social Safety Nets in Bangladesh, An Assessment*, found overlap rates of just over 11% for three programmes reviewed⁵⁵. More active data and information sharing by project managers is strongly recommended.

Stronger monitoring and evaluation systems of food assistance programmes are needed. Weaknesses in monitoring contribute to leakages, targeting errors, mistakes in beneficiary selection, reductions in transfer values etc. Knowledge management and sharing of best monitoring practices, within the context of food security assistance programmes, should be promoted and encouraged amongst professionals with monitoring responsibilities. Peer to peer learning and support networks would be one option for promoting greater efficiency and effectiveness of service delivery. While improvements in monitoring can and should be made by institutions administering and implementing these programmes, the utilization of out-sourced monitoring and evaluation services could undoubtedly add value to the process⁵⁶. Such outsourcing would reduce the risk of internal bias, thereby providing a more objective understanding of programme performance and outcome related impacts.

⁵⁴ Various GoB sources publish food price data on a regular basis; much of this is accessible via the Internet. Examples include the GoB's MoA Department of Agricultural Marketing (DAM), and the MOFDM's Directorate of Food MIS&M.

⁵⁵ World Bank (2006) *Social Safety Nets in Bangladesh, An Assessment*. Analysis of the HIES also showed that over 11 percent of households were participating in at least two of the three programs analyzed in the survey – VGD, FFE, and FFW.

⁵⁶ World Bank (2006) *Social Safety Nets in Bangladesh, An Assessment*.

Better supply chain management is needed to maximize the operational effectiveness of complex food assistance programmes; such as the GoB's Public Food Distribution System. The system includes numerous warehouse and storage facilities at central, regional, and local levels; the movement of large volumes of in-transit stock over road and water transport networks, and finally a multitude of distribution points where assistance to beneficiaries is actually provided. Given these challenges, the enhancement of logistical and information systems is required to ensure that accurate, timely and relevant information about the quantities and qualities of food stocks are available when needed to support effective service delivery. GoB partners such as WFP and others have a wealth of practical experience and expertise regarding supply chain management within the context of complex and large food assistance programmes. Such experience and technical expertise could be shared with the government with an aim of strengthening the overall operational effectiveness of the PFDS.

Lastly, and perhaps most importantly, strengthening the in-country capacity to assess and monitor the changing food security and nutritional status of the population is critical. Existing assessment and monitoring capacities need to be strengthened for more accurate and timely assessments, and for periodic updates that reflect changing circumstances. Such information is essential for individuals responsible for the delivery and management of ongoing assistance, but also for those involved in future planning and programme design. Quality and timely assessment and monitoring outputs would also be key inputs for advocacy and resource mobilization efforts.

ANNEX 1

Table A1. Districts visited

Group	Districts visited
I	Brahmanbaria, Hobiganj, Sylhet, Sunamganj, Moulavibazar, Kishoreganj, Netrakona, Gazipur
II	Bogra, Joypurhat, Gaibandha, Rangpur, Kurigram, Lalmonirhat, Nilphamari, Thakurgaon, Tangail, Jamalpur, Sherpur
III	Sirajganj, Rajshahi, Naogaon, Natore, Pabna, Kushtia, Jhenidah, Faridpur, Manikganj
IV	Jessore, Chittagong, Comilla, Khulna, Chandpur, Madaripur, Feni, baribal, Bagherhat

ANNEX 2

Table A2. Bangladesh: Crop calendar for main cereal crops cultivated

Crop	Sowing period	Harvesting period
Aus Paddy	Mid-March to mid-April	Mid-July -August
Broadcast Aman Paddy	Mid-March to mid-April	Mid-November to Mid-December
Transplanted Aman Paddy (transplanted Aman)	Late June to September	December-January
Local Boro Paddy	Mid-November to mid-January	April-May
High Yielding Boro Paddy	December to mid-February	Mid-April to June
Wheat	November to December	March to Mid-April
Potato	Mid-September to November	Mid-January to March
Maize	Mid-October to late December. 5 percent of maize grown in Kharif season.	Early April to end of May

Source: Agricultural Statistics, BBS and Ministry of Agriculture.

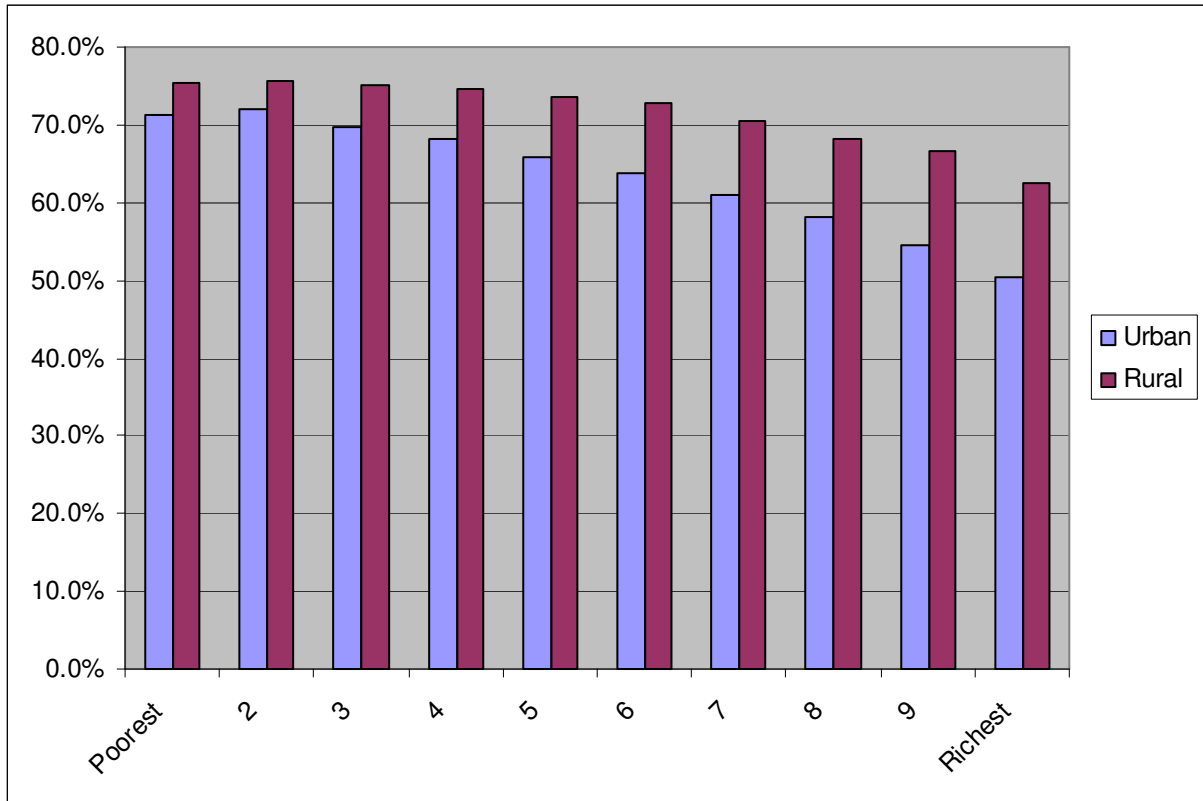
ANNEX 3

Table A3. Bangladesh: 2007/08 rice production by district (area in '000 ha, yield in ton/ha, and prod. in '000 tonnes)

District	Aman in 2007			Boro in 2008			Aus in 2008			Total Rice in 2007/08		
	Area	Yield	Prod.	Area	Yield	Prod.	Area	Yield	Prod.	Area	Yield	Prod.
01. Barguna	93.3	1.0	92.9	0.4	2.0	0.8	35.8	1.8	64.0	129.5	1.2	157.7
02. Barisal	115.4	1.1	126.9	55.5	3.2	175.2	31.3	1.3	40.9	202.2	1.7	343.1
03. Bhola	142.6	1.4	199.7	48.7	4.1	199.0	47.6	1.4	66.0	238.9	1.9	464.7
04. Jhalokati	44.3	1.3	58.6	9.6	3.4	32.6	44.7	1.4	64.4	98.6	1.6	155.6
05. Patuakhali	192.4	1.0	195.3	5.0	2.1	10.5	46.8	1.4	65.3	244.2	1.1	271.1
06. Pirojpur	76.8	1.2	92.8	15.3	3.1	48.2	44.2	1.3	59.5	136.3	1.5	200.5
07. Faridpur	28.8	1.3	38.7	34.1	3.8	129.4	26.0	1.0	26.7	88.9	2.2	194.7
08. Gopalganj	18.7	0.8	15.5	73.2	4.1	302.7	16.5	0.8	13.6	108.4	3.1	331.9
09. Madaripur	24.8	1.0	24.6	44.2	3.4	149.9	12.3	0.9	11.0	81.3	2.3	185.4
10. Rajbari	36.9	2.2	80.2	21.4	3.7	80.0	14.0	1.1	15.2	72.4	2.4	175.4
11. Shariatpur	10.0	0.9	8.6	37.0	4.1	150.0	21.7	0.8	18.4	68.7	2.6	177.0
12. Dhaka	7.4	1.3	9.7	52.6	3.9	204.3	3.8	0.9	3.6	63.8	3.4	217.5
13. Gazipur	39.8	2.4	94.0	57.9	3.3	191.0	4.8	1.3	6.1	102.4	2.8	291.1
14. Manikganj	8.7	1.0	8.4	53.4	4.0	212.1	6.2	0.7	4.0	68.3	3.3	224.5
15. Munshiganj	17.4	0.8	13.2	23.4	3.8	90.0	5.3	1.3	6.6	46.1	2.4	109.8
16. Narayanganj	13.1	1.1	14.5	34.0	3.8	129.3	1.7	1.0	1.7	48.9	3.0	145.4
17. Narshingdi	43.3	2.2	94.0	56.8	3.0	169.6	1.3	1.0	1.4	101.5	2.6	264.9
18. Tangail	99.5	1.7	170.9	164.0	3.7	614.9	9.2	1.3	11.8	272.8	2.9	797.6
19. Jamalpur	86.3	1.8	152.1	114.0	4.3	490.2	1.1	1.2	1.3	201.4	3.2	643.6
20. Kishoreganj	63.3	1.8	114.3	163.5	3.5	572.1	22.0	1.8	39.5	248.7	2.9	726.0
21. Mymensingh	252.9	1.9	491.4	239.5	4.1	982.1	56.6	1.7	93.8	549.0	2.9	1 567.3
22. Netrakona	111.2	2.0	221.3	160.5	3.7	593.7	8.5	1.7	14.5	280.2	3.0	829.5
23. Sherpur	76.1	1.4	103.8	81.0	4.1	333.7	12.1	1.2	14.6	169.1	2.7	452.0
24. Chittagong	182.4	2.4	440.3	73.8	2.8	209.6	41.7	2.2	93.4	298.0	2.5	743.4
25. Cox's Bazar	65.3	2.7	174.7	46.8	3.2	150.8	0.7	2.7	1.8	112.8	2.9	327.3
26. Feni	43.7	2.4	104.9	29.2	3.6	106.3	16.4	1.7	27.8	89.3	2.7	239.0
27. Lakshmipur	64.2	1.5	96.9	27.2	3.4	92.9	27.4	1.4	39.5	118.8	1.9	229.3
28. Noakhali	100.5	1.2	125.3	46.2	2.8	131.5	38.5	1.5	56.6	185.1	1.7	313.4
29. Bandarban	8.1	2.6	21.1	5.8	1.5	9.0	8.2	1.3	11.0	22.2	1.9	41.1
30. Khagrachari	29.0	2.1	61.4	10.9	3.6	39.7	2.6	2.3	6.2	42.5	2.5	107.2
31. Rangamati	7.3	2.3	17.0	8.2	1.8	15.0	5.3	1.6	8.4	20.8	1.9	40.4
32. Brahmanbaria	46.2	1.6	72.2	106.4	3.8	404.3	8.9	1.3	11.8	161.4	3.0	488.3
33. Chandpur	34.0	1.2	42.4	65.8	3.5	232.2	21.2	1.7	35.6	121.0	2.6	310.2
34. Comilla	148.2	1.9	279.8	162.3	3.7	608.1	52.2	1.5	78.3	362.6	2.7	966.2
35. Habiganj	86.3	1.9	166.1	95.1	3.3	313.9	33.2	1.8	59.5	214.6	2.5	539.5
36. Maulavibazar	90.8	2.4	220.1	45.9	2.9	133.2	32.5	1.9	60.4	169.2	2.4	413.7
37. Sunamganj	40.6	1.8	72.4	180.2	3.3	594.8	4.9	1.5	7.6	225.8	3.0	674.8
38. Sylhet	96.8	1.9	184.1	55.6	2.9	161.1	35.7	1.7	60.2	188.0	2.2	405.4
39. Bagherhat	105.6	1.3	136.3	32.2	3.0	96.6	5.9	2.0	11.6	143.7	1.7	244.5
40. Chuadanga	35.3	2.4	86.4	33.8	3.7	126.6	9.6	1.8	17.7	78.7	2.9	230.8
41. Jessore	137.5	2.6	354.6	152.3	4.3	659.9	27.1	2.6	69.8	316.9	3.4	1 084.3
42. Jhenaidha	90.6	2.4	217.0	77.2	2.6	199.9	13.9	1.7	23.6	181.7	2.4	440.6
43. Khulna	108.3	1.8	192.9	41.6	3.1	130.2	4.5	1.3	5.7	154.4	2.1	328.7
44. Kushtia	67.2	2.4	159.0	30.5	3.3	100.2	27.9	1.6	45.1	125.6	2.4	304.2
45. Magura	39.4	2.3	91.8	40.8	3.7	150.6	6.0	1.4	8.5	86.2	2.9	250.9
46. Meherpur	24.5	2.4	58.2	24.9	3.9	96.4	3.8	1.8	6.7	53.1	3.0	161.3
47. Narail	41.7	1.8	73.3	33.8	3.7	125.4	12.3	1.1	13.1	87.9	2.4	211.8
48. Satkhira	98.5	2.3	227.1	72.9	4.0	293.6	1.9	2.4	4.4	173.3	3.0	525.2
49. Bogra	166.5	2.2	365.9	192.0	4.2	810.0	7.5	1.8	13.4	366.0	3.2	1 189.3
50. Joypurhat	68.0	2.3	157.6	72.0	4.2	302.4	0.2	1.9	0.4	140.2	3.3	460.4
51. Naogaon	188.2	2.6	484.5	196.5	4.0	787.0	18.7	2.0	38.3	403.4	3.2	1 309.9
52. Natore	60.0	1.9	114.2	68.3	3.9	269.3	8.3	1.4	11.7	136.6	2.9	395.2
53. Nawabganj	48.6	2.9	140.4	57.0	3.4	191.8	27.1	1.9	50.9	132.7	2.9	383.1
54. Pabna	101.0	1.9	191.7	67.3	4.0	269.8	22.2	1.1	24.2	190.5	2.5	485.7
55. Rajshahi	69.0	2.6	177.1	77.2	4.4	337.4	27.1	2.0	53.5	173.3	3.3	568.0
56. Serajganj	23.7	1.3	31.3	132.0	4.1	535.1	0.8	1.5	1.2	156.5	3.6	567.6
57. Dinajpur	234.6	2.4	553.9	170.0	4.3	725.0	8.6	2.1	18.0	413.2	3.1	1 296.9
58. Gaibandha	102.1	1.9	190.1	110.0	4.1	450.0	0.1	1.6	0.1	212.2	3.0	640.2
59. Kurigram	90.7	1.7	151.5	91.0	3.8	345.8	3.5	0.9	3.3	185.2	2.7	500.6
60. Lalmonirhat	73.6	1.9	140.7	51.0	3.9	198.9	0.6	1.4	0.8	125.2	2.7	340.4
61. Nilphamari	107.4	1.8	189.4	79.0	4.1	324.6	0.0	0.0	0.0	186.4	2.8	514.0
62. Panchagarh	85.6	1.9	165.0	47.6	3.9	185.0	0.7	1.2	0.9	133.9	2.6	350.9
63. Rangpur	135.1	2.0	265.7	128.0	4.0	512.0	0.0	0.0	0.0	263.1	3.0	777.7
64. Thakurgaon	98.9	2.5	246.5	60.0	4.2	252.0	0.0	0.0	0.0	158.9	3.1	498.5
Bangladesh	5 047.9	1.9	9 662.2	4 643.4	3.8	1 7539.1	1 041.1	1.7	1 647.4	10 732.4	2.7	28 848.7

ANNEX 4

Figure A1. Bangladesh: Share of rice in total caloric intake



Source: Calculated by the Mission based on BBS 2005 HIES data.

ANNEX 5

Map A1. Bangladesh: areas visited by four Mission teams

