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Review

Food and nutrition of Bangladesh

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Bangladesh is a densely populated developing country in the Southern Asia. Since the independence in 1971, its main concern is food insecurity. Food production in the country becomes about tripled in 2013 than that was in 1971, but population became more than double. In Bangladesh, about 31.51% of the populations still live below the poverty line, heavily undernourished with inadequate access to safe and nutritious food for a healthy life. Global supply and demand of food commodities, low harvest and natural calamities are some causes of increasing of the food prices. The government of Bangladesh is trying to reduce poverty by implementing various kinds of Social Safety Net Programmes. The government also imposes subsidies in food, agriculture and agricultural materials to improve the food production. But these attempts will not provide permanent solution to food security and economic development of the citizens. In Bangladesh, during 2000 to 2005, income poverty reduced from 48.9 to 40.0% and 2005 to 2010 reduced from 40 to 31.50%. The present government has targeted to reduce poverty rate to 25 and 15% by 2013 and 2021, respectively. Various microfinance programmes also help the poor to reduce the food insecurity and poverty of the country.

Key words: Food aid, food and cash transfer, inflation, poverty, social safety nets, subsidies in food.

INTRODUCTION

Bangladesh is a densely populated developing country in the Southern Asia with a total area of 147,872 km². In 2013, its populations became more than 160 millions. The population density of Bangladesh is about 1,082/km², which is the highest in the South Asian countries. Hence the large populations became burden due to the limited resources of the country. About 77% of the populations live in the rural areas. But recently the rural people are rapidly urbanizing in search of employment opportunities especially in garments factories, construction sites and as workers in transportation sector. Agriculture is the main source of income; about 80% of the populations are involved with this sector. The laborers find low-wage, no job security and without retirement benefits in this sector.

The administrative structure of Bangladesh consists of divisions, districts, *upazilas* (sub-districts), unions and villages, in order of decreasing size. There are 7 divisions, 64 districts, 507 *upazilas*, 4,463 unions and 68,000 villages (Figure 1). Food security refers to

physical and social access by all people at all times to enough food for a healthy productive life (FAO, 2000). Food for all the citizens is a basic right asserted by the National Constitution of Bangladesh. In Bangladesh the sufficient production, distribution and availability of essential food items have always been a cause for anxiety for successive governments, international donor organizations and socio-economic researchers. Rice is the staple food of Bangladesh and among the 94% of all food grains produced annually is rice. About 40% of the total national employment and 48% of rural employment is generated from the rice sector. In Bangladesh, a large mass of the rural population still live below the poverty line (less than \$1.00 a day or unable to afford buying of food providing a daily intake of 2,100 Kilocalories), heavily undernourished with inadequate access to safe and nutritious food for a healthy life. The rural development is an essential pre-requisite for the formulation and implementation of an effective strategy for increasing food security, reducing poverty and



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Figure 1. Map of Bangladesh.

promoting overall economic growth.

In Bangladesh, consumption of only rice is about 400 gm/capita/day. Wheat is the second food grain, followed by maize which is in the third position. In 1970s, about 70% people of Bangladesh were under the food consumption poverty line and at present it is down to less than half of the population but still it is far from being food secure. More than half of the children of Bangladesh are underweight, which is obviously the signal of malnutrition of the future generation. According to the latest Household Income and Expenditure Survey 2010 (HIES, 2010), about one-third people of Bangladesh are living below the national poverty line. Population of Bangladesh below the poverty line in 1995, 2004, 2008, and 2010 were 35.6, 45, 36.3 and 31.51%, respectively (Table 1), (Country Profile, 2013).

In Bangladesh, a remarkable progress has been performed in achieving its food security, although there were ups and downs in production of food grains. Since the independence of Bangladesh in 1971, production and consumption of food grains grew over time. The price hike for agricultural commodities, particularly rice and wheat in 2007 and 2008, has posed a major challenge to food security in Bangladesh. Imports from international market was a very difficult task in these years due to restrictions on rice exports by major rice exporting

countries such as India, Vietnam, Cambodia and Egypt.

Bangladesh can reasonably desire to become a middle-income country by 2020, which require a sustained 7.5% annual gross domestic product (GDP) growth or more. To achieve this, Bangladesh will need a series of structural changes to ensure a more rapid, sustained and employment-generating growth. Bangladesh is also one of the most vulnerable countries to weather variability and natural disasters (World Bank, 2007).

The rise of food price has a severe impact over the marginalized people. The prices of rice in Bangladesh were highly volatile between 2003 and 2009, and the gross income of the poor decreased by 36.7% due to surge of food items. In Bangladesh, food prices are increased by 72% over a period of only 10 months from June 2007 to April 2008 at the backdrop of global food prices hike. This rising inflation has become an alarming threat to the poor and middle class people from all segments of the society. According to the World Bank, about four million people of Bangladesh have been pushed below the poverty line due to abnormal rise in food prices.

The global rice trade is very small and only India can greatly influence world rice market prices. Only one million tones increase in rice export or import by India

Table 1. Population of Bangladesh below the poverty line.

| Bangladesh | 1995 | 2004 | 2008 | 2010 |
|---------------------------------------|-------------|-------------|-------------|-------------|
| Population below the poverty line (%) | 35.6 | 45 | 36.3 | 31.51 |

can change the world rice market price by 4.7% (Jha and Srinivasan, 1999). Bangladesh mainly imports milled rice. India is the major source of rice import of Bangladesh and other countries are Myanmar, Pakistan, Thailand and Vietnam. Access to globally available food of a country is a function of export earnings, world prices, and debt-service obligations, as well as the policies and capacities of food aid donors. On the other hand, a household's access to food depends on food prices, household income, and the asset or resource base.

From fiscal year (FY) 2001 to FY 2005, the annual average inflation rate was low; the annual average inflation calculated on Consumer Price Index (CPI) method was less than 2.5% during FY 2001–2002, 4.4% in FY 2003, and a record of 10% in FY 2008 in the last decade. The price spiral between 2001 and early 2005 were mainly because of non-economic factors like extortion, syndication, etc. and economic factors like exchange rate depreciation, inadequate agriculture subsidy, increasing transportation cost, and fuel costs, etc., increased the cost of production.

In Bangladesh, 76% of total population lives in the rural areas and 90% of these villagers are directly related to agriculture. The sector employs about 51% of the total labor force of the country and provides over 90% of the rural employment (Bangladesh Bureau of Statistics, 2004). Food grain production in 2005 was 27.26 million metric ton (mMT), in the FY 2006–2007 was 28.05 mMT, in the FY 2007–2008 was 29.54 mMT. Every year, Bangladesh imports (government commercial import, import under food aid and private import) food grains, the figure is gradually increasing to meet the additional requirements in general and to stabilize the food market as well as to take precautions to address the unforeseen incidents in particular (Ahmed et al., 2009b).

According to the Household Income Expenditure Survey (HIES), the calorie intake decreased to 2,238.5 Kcal/capita/day in 2005 from 2,263 Kcal/capita/day in 2000; whereas, cereals which is one of the main source of calorie intake decreased to 469.2 gm/capita/day from 486.7 gm/capita/day (Bangladesh Bureau of Statistics, 2005). Over the past three decades, rapid expansion of green revolution technologies, irrigation in dry season, government subsidies in agriculture, improved seeds, increase of arable land, appropriate pesticides use and sufficient fertilizer use; have led to a rapid increase in rice and wheat production in Bangladesh.

The Millennium Development Goals (MDG) of Bangladesh by the year 2015 has the following aims:

1. Eradicate hunger, chronic food insecurity, and extreme destitution; reduce poverty by 50%.
2. Attain universal primary education for all of primary school age children.
3. Eliminate gender disparity in primary and secondary school education.
4. Reduce infant and under five mortality rates by 65% and eliminate gender disparity in child mortality.
5. Reduce the proportion of malnourished under five children by 50% and eliminate gender disparity in child malnutrition.
6. Reduce maternal mortality rate by 50%.
7. Ensure access to reproductive health services to all.
8. Reduce substantially, if not totally, social violence against women and children.
9. Ensure disaster management and prevent environmental degradation for overcoming the persistence of deprivation.

Objective of the study

The objective of the study is to discuss food and nutrition situation of Bangladesh. Rice is staple food of Bangladesh. Production of new variety of genetically modified crops should be increased to reduce poverty. After the independence in 1971, the country was able to develop in food and nutrition sector but yet about 31.51% of the populations live below the poverty line. The government of Bangladesh (GoB) is trying to develop the country in food and nutrition and is taking various attempts to reduce poverty. The citizens are also concern about their health than that was during the independence. This study discusses how the country will develop economically and will build a healthy nation in future. The aim of the study is that no persons will be deprived from the right of food and nutrition. The study stresses on the food price hike which is a main problem to the reduction of poverty of the country. The over food price inflation needs to be controlled for food security of the poor. This study also highlighted to face natural calamities and increase food production to make the country self sufficient in food, so that no people have to starve.

NATURAL CALAMITIES IN BANGLADESH

Bangladesh faces natural disasters such as, devastating

floods, cyclone, tornado, storm, drought, earth quake, tidal surge, river bank erosion, salinity expansion, infrastructure collapse, fire, tsunami, arsenic contamination in ground water, Monga (about to famine in north-western part of Bangladesh) which pose multiple threats to the development of the country.

Over the last 42 years after the independence in 1971, the people of Bangladesh faced a number of man-made and natural calamities, such as a famine in 1974, floods in 1987 and 1988, a cyclone in 1991 (about 150,000 people had died and a great deal of assets destructed and many people became homeless), a flood in 1998 (75% of the total area of the country was flooded), two cyclones SIDR (15 November 2007) and AILA (25 May 2009).

Food prices were more unstable during the 1974 famine due to severe rice shortages caused by drought-related production shortfalls and shortage of foreign exchange for government rice imports. At this time, Bangladesh faced an ever record of price hike (mainly in food) from 9.1 to 108.6%. The main causes of these disasters in the country are as follows:

1. High monsoon rainfall in the country, and especially in India and Nepal.
2. Deforestation throughout the country.
3. Use of excess chemical fertilizers and pesticides.
4. Geographical and topographical features of the country.
5. Destruction of habitats and unplanned shrimp cultivation.
6. Lack of efficiencies in flood control.
7. Global warming and climate change.
8. Excessive withdrawal of ground water.
9. Unplanned urbanization and industrialization.

In Bangladesh, women and girls suffer more than men and boys during the natural calamities and man-made disasters, such as, poverty, hunger, malnutrition and health related problems, economic crises, environmental degradation, and become victim of violence and political crises.

WATER MANAGEMENT AND IRRIGATION SYSTEM

In Bangladesh, the irrigation command area increased from about 1.6 million hectares in 1979 to about 4.4 million hectares in 2001 and an annual rate of increase is over 4%, which is about 3 times the average for the Asia and Pacific region. In 2003, the total irrigation area was 50,500 km² in the country. Irrigation is a major challenge for farmers growing crops in the dry season. Majority of the farmers purchase water from pump owners. In Bangladesh, efficiency of water use for irrigation is low. Scientists have already proved that adoption of alternate

wet and dry (AWD) irrigation technology for Boro rice cultivation can save 25% irrigation water, as well as save energy (electricity, diesel and other fuels) without reducing the yield level and this will reduce per unit production cost of rice. About 90% of the total irrigated area is under diesel-driven engines, while rest of the area is under electricity-operated engines.

There are some constraints to the expansion of the irrigation in Bangladesh and three of them are as follows:

1. Low water use efficiency and productivity (the irrigation water use efficiency in shallow tube-wells (STW) and deep tube-wells (DTW) command areas is below 60%).
2. About 90% of the water pumps are operated by diesel, so that irrigation cost is very high. Diesel supply and high price problems occur during peak irrigation season. Adequate supply of diesel at reasonable prices is essential to support irrigated agriculture.
3. Lowering of the ground water table during the dry season in March, April and May (ground water is also used for drinking purpose).

In the irrigation, the charges of water are different in different regions depending on the irrigation system. Three modes of payment of water charge are, i) crop sharing arrangement, ii) fixed charge on per acre basis, and iii) machine rental system, where the farmers directly supply diesel. Every year, all kinds of irrigation expenditures are increasing due to the increase of energy prices, labor cost, transportation cost, etc. Irrigation cost in Bangladesh is two to three times higher than in India, Thailand and Vietnam, because Bangladesh farmers have to use diesel for irrigation system. Usually, farmers experience a shortfall in electricity supply in the Boro season. In some remote areas of Bangladesh, there is no electricity supply and the farmers of those areas must depend only on diesel.

In Bangladesh, availability of water is more than sufficient in rainy seasons and use of surface water efficiently can help to increase ground water table. Annual renewable per capita water in Bangladesh is 8,000 m³/year, which is one of the highest in the world; but water distribution over time is very uneven. About 80% of this water is received during the months of July to October; and the country does not have favorable topography for storing the water during the rainy season for subsequent use in the dry season. Management system of surface water is inadequate and the modern technologies must be used to the maximum use of surface water.

The Boro revolution helped stabilize the supply of grains and contributed to higher farm income, which in turn resulted in significant reduction in poverty, hunger and food insecurity. So that efficient irrigation systems in dry season will help for a bumper Boro production in Bangladesh. The government of Bangladesh takes some

special steps to ensure the supply of required electricity for irrigation but these are not sufficient for proper irrigation. Local government organizations prepare the list of eligible farmers along with citizenship number provided in their national ID card. Government provides subsidies in diesel to the farmers for irrigation through the bank channels. In Bangladesh, only one district, Dinajpur, has very high area under electricity-operated engines (more than 100,000 ha); 8 districts Tangail, Sirajganj, Rajshahi, Naogaon, Mymensingh, Jessore, Comilla and Bogra have high area (40,001 to 100,000 ha) under irrigation; 16 districts Bagerhat, Barisal, Bhola, Chuadanga, Faridpur, Gopalganj, Khulna, Lakshmipur, Magura, Meherpur, Munshiganj, Narail, Narayanganj, Rajbari, Shariatpur and Sunamganj have medium area (10,001 to 40,000 ha) under electricity-operated engines; 7 districts, Bandarban, Barguna, Khagrachhari, Moulvibazar, Pirojpur, Rangamati and Sylhet have negligible (up to 1,000 ha) area under electricity-operated irrigation system (Deb et al., 2009). The irrigation system creates acidification in the soil up to 6% and the farmers have to use alkaline materials to decrease acid from the soil.

Land possession system in Bangladesh

In Bangladesh, about 10% of farmers own 50% of the land and about 60% of farmers are functionally landless and depend on sharecropping land owned by landlords. The sharecroppers bear all the costs of production of the rice crop and other crops, including water costs of 20–25% of the crop production. The sharecropper then shares 75–80% of the crop equally with the landlord, thereby receiving from 37.5–40% of the total crop for his work and investment. The interest rate of commercial banks is 10% for crop loans but sharecroppers often do not have the necessary collateral to obtain loans from commercial banks, which makes them dependent on local moneylenders who charge very high interest rates of typically 10% per month over the 3–4 month duration of the crop. As a result, in Bangladesh the sharecroppers are exploited by money-lenders and landlords (Fang et al., 2008).

Rapid urbanization and increasing use of land for infrastructural development causes 1% annual loss of agricultural land. Since demand for labor in agricultural production is seasonal, during the slack season, the landless farmers remain virtually unemployed and they have no savings to maintain their family. As a result most of the poor have to starve for days or eat very less.

EFFECTS OF FOOD PRICE INFLATION

The food price inflation has a stern impact over the marginalized people of Bangladesh. Food inflation leaves

a harmful impact on the purchasing power when the per capita GDP does not correspond with inflation. GDP means value of all final goods and services produced within a nation in a given year. A nation's GDP at purchasing power parity (PPP) exchange rates is the sum value of all goods and services produced in the country valued at prices prevailing in the USA. In Bangladesh, GDP in PPP was about \$305.5 billion and per capita GDP in PPP was about \$2,000 in 2012. The International Monetary Fund (IMF) warned Bangladesh that excess liquidity and resurgent international commodity and food prices might push inflation to double-digit levels by year-end of 2009 (The Daily Star, 30 October 2009). Bangladesh has already experienced a double-digit food inflation rate on point-to-point basis since July 2007.

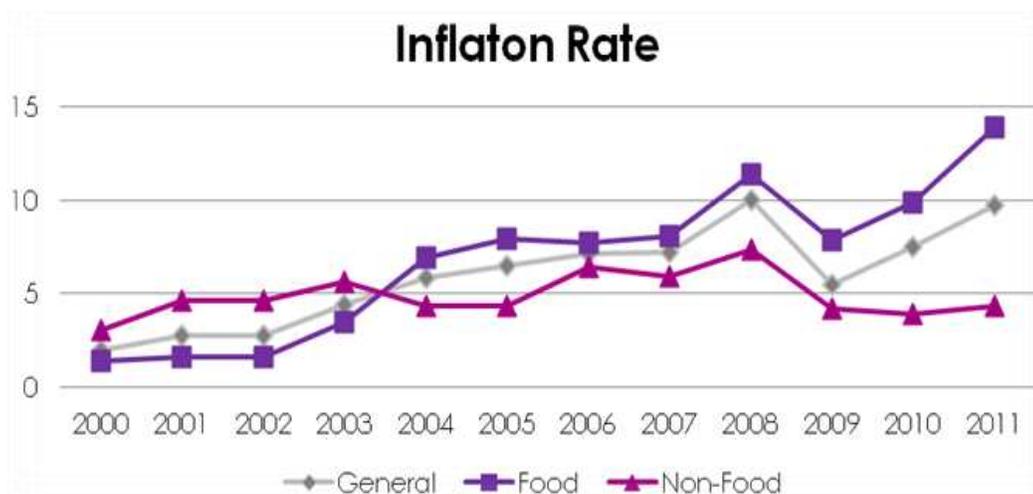
Rice is the staple food of Bangladesh and wheat is in the second position. Change in prices of two food stuffs affects the people most adversely than changes in prices of any other commodity. Persistent high inflation may unleash forces that jeopardize macroeconomic stability and economic growth. Between September 2009 and September 2010, the nominal rice and wheat prices increased by 63 and 33% respectively. The corresponding real prices also have risen by 53 and 24%, with a substantial rate of increase in rice prices (Bangladesh Economic Update, 2011a). In Bangladesh, food prices continued to increase and drove up the overall inflation rate in FY 2010–2011.

The inflation in June 2011 was 10.2% compared to 8.7% in June 2010 and food inflation rate was higher than the general inflation rate. In 2012, inflation has reached about 10.92%. Higher inflation in the country is due to rising commodity prices in the world market and for the higher spending than the budget of the government. The inflationary remain unchanged despite a bumper production of rice, potato, fruits and vegetables due to the borrowing of the government from the banks. Consumer prices inflation rates in percent from 1998 to 2012 are given in Table 2 (Country Profile, 2013). During the last quarter of the year 2010, the average global food price index increased by 2.93% whereas the average local food price of Bangladesh increased by 0.70% and the general inflation increased by 0.53%. The continued increase in food prices has been suggested due to global crisis and increasing political and economical instability, particularly in the under developed and developing countries. The price that drastically increased in 2007 had faced a downward trend after June 2008, but from 2009 the price has started to rise again (Bangladesh Economic Update, 2011a). Inflation of food prices became more than non-food items after 2003 (Figure 2).

There is a positive relationship between food inflation and poverty. As the food inflation increases, most people go under the poverty line those were above the poverty line before the food price rises. Hence, if food price

Table 2. Consumer prices inflation rates of Bangladesh.

| Bangladesh | 1998 | 2000 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|-------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|-------|
| Consumer prices inflation (%) | 9 | 5.8 | 3.1 | 5.6 | 6 | 7 | 7.2 | 9.1 | 8.9 | 5.4 | 8.7 | 10.2 | 10.92 |

**Figure 2.** Inflation of general, food, non-food items in Bangladesh.

inflation fluctuates it will increase tally of extremely poor in future. Government expenditure is increasing gradually than revenue receipts in recent years (2012-2013) partly due to adjustment to inflationary pressure and may keep on increasing further in the forthcoming years, creating more budgetary deficit. As government expenditure is following a continuous upward trend than that of revenue receipt, the ratio of government expenditure and GDP may reach 15.46 in FY 2014–2015 (Bangladesh Economic Update, 2011b). The aim of the government of Bangladesh is to bring down the poverty rate from 40% of 2005 to 15% by 2021. If the inflation of food price cannot be controlled then this goal of development is impossible.

FOOD AND NUTRITIONAL SCENARIO IN BANGLADESH

In Bangladesh, food production data are collected by BBS, Bangladesh Rice Research Institute (BRRI), Bangladesh Agricultural Research Institute (BARI), Department of Agriculture Extension (DAE), Ministry of Food and Ministry of Agriculture on a regular basis; BBS is the only authorized body under government structure to publish production data. According to their collected data, in the last decade production of rice has increased, vegetable production was almost doubled, potato production increase 2.5 fold, fish production has

increased due to increase in inland fishery, meat production has increased, superseding the rate of increase in population, Egg and milk production also increased in parallel. On the other hand, total production of pulses (one of the major sources of protein for the poor), oilseeds and fruits has gone down. The market demand on pulses, edible oils, fruits and spices are fulfilled mainly by the import. The net production availability of sweeteners and spices remained almost unchanged during the last decade. But the country still is deficient in production of all the non-cereal food items to provide balanced food for all. Meat and fishes are imported for the fulfillment of protein deficiency.

During the independence in 1971, Aman was the major food crop, which was the dominant source of total rice production. Structure of rice production in Bangladesh has remarkably changed over time. In 2013, Aman rice occupies 50% of total rice area and contributes 38% of total production, Boro contributes about 41% of total rice area and contributes 56% of total rice production in Bangladesh and Aus rice supplies about 9% of total rice area and 6% of rice production. The development of cultivation system, inclusion of non-cultivable land in cultivation, increased production of rice thrice in a year, invention of new variety of species and expansion of irrigation system, increased the production of rice over time.

In Bangladesh, there are three types of poor as follows

Table 3. Per capita calorie and protein intake in rural and urban areas.

| Year | Calorie (Kcal/capita/day) | | Protein (gm/capita/day) | |
|-----------|---------------------------|-------|-------------------------|-------|
| | Rural | Urban | Rural | Urban |
| 1995–1996 | 2,251 | 2,209 | 64 | 68 |
| 2000 | 2,263 | 2,150 | 62 | 65 |
| 2005 | 2,253 | 2,194 | 62 | 65 |

(Khuda, 2011):

1. The chronic poor: Those who are poor even during good times, because they have limited access to assets and income to manage risks and even small reductions in their assets and income can have serious adverse consequences for them.
2. The transient poor: Those who live close to the poverty line and could fall into poverty when an earning individual household die or the economy as a whole faces hardships.
3. Other vulnerable population: The groups for whom general stability and prosperity alone would not be sufficient such as the disabled and divorced/separated/widowed women without access to any regular employment or find no help of others.

There are two methods: i) Food Energy Intake (FEI), and ii) Direct Calorie Intake (DCI) methods in order to measure the incidence of income poverty. The poverty line in Bangladesh is officially calculated in terms of energy intake. By DCI method for maintaining normal health, a person needs minimum of 2,122 Kcal/day (official calculation) but the FAO and WHO recommendation is 2,400 Kcal/capita/day. In Bangladesh, 40% of the population (64 million) are categorized as absolute poor, who fail to acquire the minimum level of food energy to maintain normal health, 32 million people are categorized as hard-core poor, who fail to acquire 1,805 Kcal/person/day, and 13 million are ultra poor, who fail to acquire 1,600 Kcal/person/day (Bangladesh Bureau of Statistics, 2007). The World Bank (1996) defines the ultra poor as those who have no land or house of their own, sell manual labor with no other means of income, have no savings, are unable to have three meals a day, cannot afford to purchase minimum clothing and have no ability to spend money on education. These poor people have very little assets and suffer from instability and frustration in everyday life. The diet of the poor is seriously imbalanced, with extremely inadequate intake of fats, protein, minerals and vitamins. It is estimated that above 75% of calorie intake is derived from rice, which is far above international norms. When the price of rice is decreased then the poor take more rice (with small amount of curries or salt or a pepper) to mitigate hunger. As a result, they suffer from malnutrition,

although they can mitigate hunger. The intake of calorie and protein from 1995–1996 to 2005 for rural, urban and all households of Bangladesh are given in Table 3.

The World Bank (WB), the government of Bangladesh (GoB) and the United Nations (UN) in their respective reports on millennium development goals (MDGs), express the target of 34% children being underweight as non-attainable at present rates of progress. It is estimated that girls and women are overwhelmingly more malnourished than boys and men. We have to take enormous efforts to achieve the 2015 MDG target of halving the proportion of people who suffer from hunger and malnutrition. Achieving the MDG targets within 2015, the government of Bangladesh is taken the following attempts (GoB, 2005):

1. Promoting food security by sustaining strong growth of domestic food production and implementing a liberalized administration for food imports.
2. Designing and implementing interventions to promote food security.
3. Supporting safety nets for protection against natural disasters.
4. Promoting change in food habits for increasing nutritional intake of vulnerable.
5. Promoting improved infant feeding practices, including breast-feeding practices.
6. Supporting maternal schooling and hygienic practices.
7. Improving access to safe drinking water, especially by addressing the threat of arsenic contamination of underground water.
8. Improving access to sanitation.
9. Improving access to basic health facilities.
10. Promoting partnership among the government, private sector and non-government organizations (NGOs).

Bangladesh has obtained food through domestic production, imports and food aid. In Bangladesh, the first two sources have increased but the third has decreased (GoB, 2005). The poverty of Bangladesh is not decreasing due to low income of most of the populations, recurrent natural calamities, increase of population and increasing international prices of food commodities. The cereal food production (including maize) was 27.35 mMTs in 2004–2005. Unfortunately food aid declines

from about 600,000 MT in 1990s to about 300,000 MT in 2004 (Bangladesh Bureau of Statistics, 2005).

The food price increase created a range of macro-vulnerabilities in the country. Annual price fluctuations in Bangladesh arise mostly from fluctuation in production, which again can be attributed to the random effect of floods and drought. Government of Bangladesh should procure crops during the crop season and allocate these to the extremely poor by Open Market Sales (OMS) and other sales channels, during the price hike periods. Although rice and vegetable productions are largely sufficient but production of other food commodities such as edible oil is very low compare to the national demand. For example, Bangladesh produces only 34% of its edible oil and about 70% is needed to be imported.

Food security

Food security is broadly defined as physical and economic access by all people at all times to sufficient food to meet their dietary needs for a healthy and productive life and nobody live in hunger or fear of starvation. It is the availability of adequate food at a national level and access to adequate food at household and individual levels and ensures sufficient conditions of a healthy life, such as the health and sanitation environment and household or public capacity to care for vulnerable members of society. Food security in Bangladesh is strongly linked with the production, import and price stability of rice. Bangladesh is the fourth largest rice producing and consuming country in the world. Every year, Bangladesh imports rice to cover the shortage of local need especially when natural calamities, such as drought, flood, cyclone, etc. occur. Food availability at the national level is determined as follows (Ahmed et al., 2009a):

1. Domestic food production.
2. Public and private food stockholding.
3. Food imports including food aid.
4. Food exports.

On the other hand, availability of food at the household level depends on the followings (von Braun et al., 1992):

1. The household's own capacity to produce food.
2. Household food stockholding.
3. Availability of food in the local markets.

The challenge of food security in Bangladesh is enormous. The extremely poor do not have adequate money to buy sufficient food, even when food is available in local markets. They are vulnerable to natural disasters or crop failure that causes transitory food insecurity. Sudden increases in food prices send them in food insecurity. In Bangladesh, food availability and access to

food are increasing, which decrease hunger, but malnutrition is not decreasing parallel to food availability due to lack of high-quality health care facilities and services.

Livelihood

Livelihood has to do with the ways and means of making a living. The most widely accepted definition of livelihood is given by Chambers and Conway (1992):

“A livelihood comprises the capabilities, assets (including both material and social resources), and activities required for a means of living.”

Ellis (2000) suggests a definition of livelihood as follows:

“The livelihood is the activities, the assets, and the access that jointly determines the living gained by an individual or household.”

Cattle, sheep, goats, poultry and ducks are livestock in Bangladesh. These are important source of income and a store of value for the many millions of families of the country. They also provide milk, meat and eggs to supplement the generally poor diets of the people; they further provide manure and fuel for the households. Bangladesh is not self sufficient in meat, milk, eggs and fish. Every year GoB and businessmen import protein rich foods, mainly cattle from India. But all people of the country find no opportunity to buy these foods sufficiently for their daily needs, as these foods are very costly.

Food gap and self-sufficiency ratio in Bangladesh

In Bangladesh, per capita average kilocalorie intake per day is 2,238.5, of which 75% of the energy intake comes from cereals. Using the conversion factor of 3.57 Kcal/gm, the daily domestic food grain requirement can be calculated as (Mohajan, 2013):

$$\begin{aligned} \text{Daily food per capita grain requirement} &= \frac{75\% \times 2238.5}{3.57} \\ &= 470.3 \text{ gm/capita/day.} \end{aligned}$$

It can be used to calculate the annual food grain requirement and food gap in the country.

$$\begin{aligned} \text{Annual food grain requirement in 2013} &= \text{Population} \times \\ &470.3 \times 365 \text{ days} = \frac{160 \times 470.3 \times 365}{1000000} = 27.5 \text{ mMT.} \end{aligned}$$

Food gap = Requirement–Domestic production.

In 2007, domestic production was 28.06 million metric ton (mMT) and total food grain requirement was 24.14 mMT.

In 2007, food gap = 24.14–28.06 = –3.92mMT.

Food import and aid benefited to maintain bumper stock for emergency purposes such as disaster, production thrust and any other supply shocks. Since population and food production technology and developed seed species are producing, domestic food production and requirement have been increasing gradually. To keep the demand supply balance every year, a large amount of food grains are imported from abroad. In Bangladesh, the government has less control over the market and the market is mainly controlled by the traders, hoarders and business syndicates. At the local level few millers who procured paddy from the small and marginal farmers also control the local rice market. Bangladesh bank data on opening Letter of Credits (L/Cs) shows that only few traders accounted for over 80% of rice import.

Self-sufficiency ratio (*SSR*) is calculated by the method of Food and Agriculture Organization (FAO). It is calculated as follows:

$$SSR = \frac{\text{production}}{\text{production} + \text{imports} - \text{exports}} \times 100$$

Based on the official and private food grain production and import data the *SSR* for Bangladesh is gradually declining (*SSR* declined to 89.7% in 2007–2008 from 94% in 2000–2001).

In Bangladesh, *SSR* is 90 to 91%, hence it has a food grain gap of 1 to 2 mMT. According to another estimate, at the present population and agricultural growth rate, the food gap could be up to 5 mMT. The different calculations are for the lack of a consensual estimation of the food gap, non-calculation of use of rice in restaurants, bakeries and fast food shops. Other reasons are, wrong calculation of population in census, wrong estimation of wastage and wrong calculation of the food grains for poultry and cattle feed, and the use of different required dietary calorie intake. For example, the government assumes 452 gm/capita/day of food grains, while FAO recommends the corresponding value 504 gm/capita/day. Due to wrong calculation of food grain gap, more than 60 million people remain hungry every day; unfortunately, the government figures do not show any food gap in the country.

Access to food in Bangladesh

Food access is correlated with food availability. Per capita food availability is actually higher than the per

capita food intake. In recent years, the rapidly increasing food price has made it difficult for the poor, low and middle income group to have access to food. In 2005, per capita food intake came down to 469.2 gm/capita/day from 486.7 gm/capita/day in 2000, over the same period food inflation increased to 7.91% from 1.38%. During the food price hike, the burden increases for the lower income groups as these groups spend a larger share of their budget on food. The individuals who have irregular income from daily wage labor and lacking productive assets, such as, day laborers, fishermen, vendors and beggars, cannot access the food perfectly. The children, disabled, and pregnant and lactating women face the greatest nutritional risk during the food price increase (Ahmed et al., 2009b).

In Bangladesh, food availability does not ensure food entitlement due to low accessibility. Local and global increasing food price is one of the main reasons that obstruct food access.

Foreign aid in Bangladesh

In the last twelve years, there is not much volatility in net foreign aid. Though total aid has been increasing over the time and in the meantime payment of principal has also been increasing, which makes a lesser net foreign aid. In FY 2001–2002, total foreign aid was \$1,142.23 million and principal payment was \$435.3 million, so that the net foreign aid is \$1,006.93 million (Figure 3). In FY 2010–2011, total foreign aid amounts \$1,777.33 million, principal payment totals \$727.54 million and net foreign aid is \$1,049.79 million (Bangladesh Economic Update, 2011a).

Food aid in Bangladesh

Following World War II, food aid programmes have been a major part of development assistance worldwide. Total global food aid deliveries averaged 10.1 million tons per year, over the past four decades, but fluctuated sharply in the 1990s based mainly on supply factors. Total food aid flows peaked in 1992–1993 at 15.2 million tons, but then declined steeply to only 5.6 million tons in 1996–1997 as the US contributions fell from 8.5 to 2.3 million tons in the same period. Total food aid again increased in 1998–1999 and 1999–2000 to over 10 million tons each year, with the US contributing about 60% of the total (Dorosh et al., 2002).

The USA, Canada, Australia and the EU Community, became food aid providers as a way of utilizing surpluses for a mixture of developmental, humanitarian, foreign policy and domestic agricultural policy and trade objectives. Since 1990s, food aid flows shifted from South Asia to Africa. Because South Asian countries increased their food production and African countries

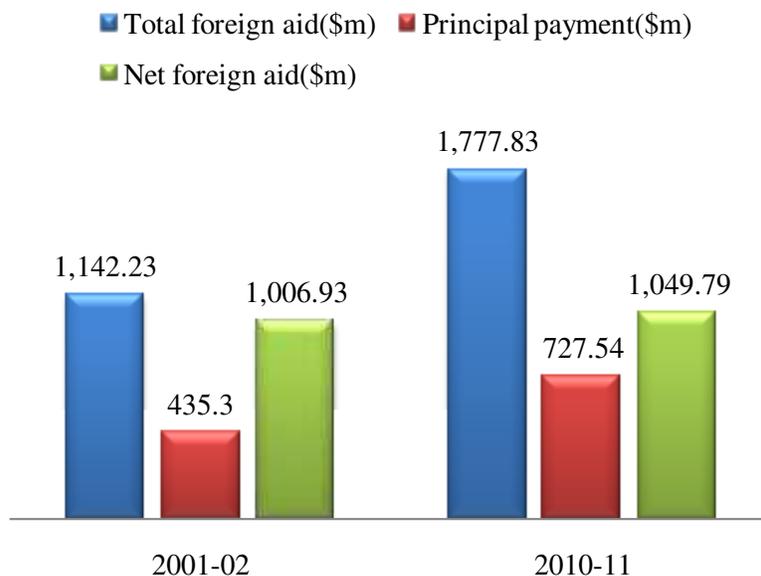


Figure 3. Comparison of foreign aid received by Bangladesh between FY 2001–2002 to 2010–2011.

became food crises due to population growth, political unrest and lack of application of modern technologies in agriculture (Shaw and Clay, 1993).

During the 1970s and 1980s, Bangladesh was one of the world's largest recipients of food aid, receiving on average about 1.2 million tons per year. During the 1990s, Bangladesh was also the largest recipient of the food aid, and it received an average of 868 thousand tons per year, which was 7.2% of the total global food aid. During this period, the next three largest food aid recipients countries were all in Sub-Saharan Africa and these are Ethiopia (6.2%), Egypt (3.8%), and Mozambique (3.2%). The total recipients of global food aid in Sub-Saharan Africa were 30.7%.

In Bangladesh, most food aid is directed into the public food grain distribution system. Food aid has played a very large and useful role in Bangladesh to increase food security in the last four decades since the independence in 1971. The food aid declined after 1990, but in 1998, major floods severely damaged the Aman rice crop of Bangladesh and then food aid levels were substantially increased. The decline of food aid is because of sustained increases in domestic production of both rice and wheat. There is a bumper crops production in 1999–2000 and 2000–2001 and food gap is completely eliminated, so that, food aid donors decided to decrease food aid in Bangladesh. In 2002, Bangladesh received a total of 0.49 mMTs food aid; this has declined further to 0.19 mMT in 2007. At the national level, food aid has added to food grain availability, which helps to reduce the food gap between food grain consumption needs and supply from domestic production. On the other hand at

the household level, food aid targeted to poor households has increased their access to food. Food aid also has helped to operate successful development projects and programmes in Bangladesh (Singer et al., 1987; Clay and Stokke, 1991; Ruttan, 1993; Dorosh et al., 2002).

Globally, most food aid is in the form of wheat and wheat flour which accounted for about 70% in the 1970s, 66% in the 1980s and only 53% in the 1990s. Since food aid ultimately increases market supply of wheat, it has the potential to lower domestic wheat prices and adversely affect incentives for domestic wheat production and incomes of wheat farmers. In Bangladesh, food aid is almost wholly in the form of wheat; only small amounts of rice and vegetable oil are received as food aid. Food aid has often been criticized for its potential to create disincentives for domestic production and distort domestic food economies. Where food aid adds to the total imports of a country, it can lower local food prices. As a result, the farmers face losses in the food production and thereby discouraging local production.

In non-emergency situations, the food aid only benefited in commercial imports and increase demand habits. The long-term food aid may create neglect habits in the local agriculture and dependency in non-agriculture labor markets increase, which create long-term food insecurity (Maxwell and Singer, 1979). Aid in cash avoids high costs of international transport, as well as domestic transport of commodities from the port to the distribution center and avoids traffic jam. Monetary aid does not directly increase availability of food but stock of government fund increases. In Bangladesh, cash transfers are more efficient than in-kind transfers.

VICTIMS OF FOOD PRICE SOAR

The poorest citizens were adversely affected during the food price soar, because the share of food expenditure is the highest for them. Day laborers, female-headed households, especially widow/divorced, separated/abandoned females; people with fixed and low income, large families with few earning members or only earning member, small and marginalized farmers who are net buyers of staple, small job holders in urban areas and self-employed people were severely affected due to the increase of food price. Extremely poor people who live in urban slums areas, such as small shop owners, vendors on footpaths, beggars, garments workers, suffer severely during the food price hike. On the other hand, some people of slum areas, such as, rickshaw and van pullers, compressed natural gas (CNG) taxi and cab drivers, did not suffer much as they charged higher fare to people and earn more to face the food price hike efficiently.

During the food price increase, some non-social activities and crimes, such as sex working, begging, smuggling, petty theft, drug trafficking, etc. increased in the society. Sometimes children, women and even elderly people are engaged in force work to mitigate hunger. Most families of the urban areas reduce the buying of beef, mutton, chicken, milk and milk products, fish, dry fish and lentil because, they have to spend half or more than half of their household incomes to buy food grains to relieve from starvation and compel to avoid these costly food items. As a result, these families suffer from malnutrition in the long run.

Food price hike also affects the lower middle class families, because they cannot spend more for food, as their income is limited and they cannot start begging due to their social status. They did not find loan from any source to face the economic crisis. Government or NGOs provide them no aid, as they are not extremely poor. Some of them have wealthy relatives but in most cases they are completely ignored by the rich relatives. Sometimes they compel to sell their only assets such as, farmland, livestock, rickshaw-vans, etc. Their schooling children have to start child labor. Eventually they become extremely poor and cannot escape from the poverty cycle.

Four areas in Bangladesh are identified as most vulnerable during the food price hike. These are, Monga (north-west part), Haor (north-central and parts of north-east), coastal river erosion (south) and the Chittagong Hill Tracts (south-east). Monga prone districts are Kurigram, Lalmonirhat, Nilphamari, Rangpur, Gaibandha, Bogra and Serajganj. The typical characteristics of the food insecurity prone districts are as follows (Ahmed et al., 2009b):

1. Crops are in the field waiting to be harvested having

no employments in the agricultural fields.

2. The household level food stock is mostly consumed amid inadequate supply of food grain in the market.

3. The price of rice in the market is very high while the marginal farmers and the laborers run out of food and cash.

In Bangladesh recently Barisal division is more severely affected due to food price soar, because there are more households who are net buyers of food and partly due to the SIDR affected areas.

SOCIAL SAFETY NET PROGRAMMES (SSNPs) IN BANGLADESH

When Joseph advised Egypt's Pharaoh to save grain during the seven heavy years so that the population would not starve during the coming seven years of famine, he was setting a social policy to provide a safety nets (Martha and Nightingale, 2010). Raja Todar Mal, one of the *Navaratnas* (nine chief scholar advisors) in Indian Emperor Akbar's council (16th century AD) had formalized state support to farmers at times of crop failure but he did not give any name of that project. Actually it was social safety net programme. Social safety net came first into the discourse during the 1980's in response to the adverse effects of structural adjustment. The concept was later popularized in East Asia during the financial crisis.

World Bank (WB) defined the SSNP as follows: "Non-contributory transfer programs targeted to the poor and the vulnerable." Asian Development Bank (ADB) defined the SSNP as follows: "Programs designed to assist the most vulnerable individuals, households and communities meet a subsistence floor and improve living standards." FAO defined SSNP as follows: "Cash or in-kind transfer programs that seek to reduce poverty by redistributing wealth and/or protect households against income shocks. Social safety nets seek to maintain a minimum level of well-being, a minimum level of nutrition or help households manage risks." International Food Policy Research Institute (IFPRI) defined the SSNP as follows: "Formal safety nets redistribute resources to poor people to reduce chronic poverty or to protect them against risks to their livelihoods-risks posed by disease, loss of employment, drought, conflict, financial crises, or macroeconomic adjustments for example."

From the above definitions we find two objectives of SSNP as follows (Zohir et al., 2010):

1. It helps the target population maintain a minimum level of consumption.
2. It creates a buffer to protect the vulnerable groups from sudden shocks.

Grosh et al. (2008) mentioned that SSNs can help to

achieve four common objectives; those are in turn part of poverty reduction goal as follows:

1. SSNs have an immediate impact on inequality and extreme poverty.
2. Enable household to make better investment in future.
3. Help households to manage risk.
4. Help governments to make beneficial reforms.

The SSNPs are designed to serve people with little money, in-educate education, poor health, or physical or mental disabilities or those living in situations where they risk abuse or neglect (Vivin, 1994).

The government of Bangladesh is trying to reduce poverty by implementing various kinds of SSN programmes since its independence in 1971. The GoB also allocated Tk. 17,327 crore (Bangladeshi currency is Taka = Tk. and \$1= Tk.87 in 2013) for the SSN in the FY 2009–2010 which is about 15.22% of total budget outlay, and 2.52% of GDP respectively, which targeted poor and ultra poor segments of the society to lift out of poverty. In FY 2010–2011, the allocation for social safety net programmes was 2.64% of GDP. For huge payment of principal and interest of debt, the government has been imposing regressive tax like value added tax (VAT) and has to reduce allocation in social safety-net programmes which adversely affect the economy of the country. Bangladesh has a widespread portfolio of both food- and cash-based SSNPs. In 2011, about 11.38 million men and 24.05 million women were engaged in social security and social empowerment act. At present there are about 27 such programmes, which cover only about 6-7% of the poor, so that, fund and beneficiaries under this programme must be increased. Among these programmes some are as follows:

1. Food-for-works (FFW): \$40 million, about 1 million participants annually.
2. Rural Maintenance Programme (RMP): \$16 million, about 42,000 participants annually.
3. Test Relief (Rural Infrastructure Maintenance Program, RIMP): \$1 million, about 100,000 beneficiaries annually.
4. Vulnerable Group Development (VGD) programme: \$40 million, about 500,000 beneficiaries annually.
5. Primary Education Stipend Project (PESP): \$100 million, more than 5.2 million beneficiaries annually.
6. Female Secondary School Assistance Programme (FSSAP): \$40 million, about 4 million beneficiaries annually.
7. Vulnerable Group Feeding (VGF) programme: \$30 million, about 240,000 beneficiaries annually.
8. Gratuitous Relief (GR) programme: No fixed amount.
9. Fund for Mitigation of Risk of Natural Disaster: \$15 million, about 100,000 beneficiaries annually.
10. Old Age Allowances: \$30 million, about 1.2 million beneficiaries annually.

11. Allowances to the Widowed, Deserted, and Destitute Women: \$3 million, about 100,000 beneficiaries annually.
12. Honorarium Programme for Insolvent Freedom Fighters (IFF): \$8 million, about 100,000 beneficiaries annually.
13. Fund for Housing for the Distressed (*Grihayana Tahabil*): No fixed amount.
14. Fund for Rehabilitation of Acid Burnt Women and the Physically Handicapped: \$4 million.

With globalization giving rise to irregular bouts of crises worldwide, new experiences were acquired during the 1990s, which subsequently led to the extension of the concept of short term safety net to longer term interventions, often coined as social protection (SP). Social protection had long been considered an issue of domestic concern in developed countries, where institutional arrangements emerged in order to protect citizens against risk and provide assistance to the destitute. ADB defined the SP as follows:

“The set of policies and programs designed to reduce poverty and vulnerability by promoting efficient labor markets, diminishing people’s exposure to risks, and enhancing their capacity to protect themselves against hazards and the interruption/loss of income.”

Objectives of SP are as follows (Zohir et al., 2010):

- 1. Prevention:** Some outcomes reduce the probability of incidence of shocks. For example, construction of a dam will reduce the risk of flooding in a particular area; agriculture insurance will protect farmers from loss of income in times of crisis.
- 2. Mitigation:** Improve the households’ resource endowment such that the hardship of a shock when it does occur is reduced. For example, beneficiaries of Food for Work (FFW) are likely to be less affected by food price hikes; construction of a cyclone shelter will enable households to protect themselves and their livestock during cyclone emergencies.
- 3. Coping:** Help reduce the everyday hardships and impoverishments of those adversely affected by shocks as well as those who are more permanently poor or destitute. For examples, initiate of Vulnerable Group Feeding (VGF) and relief.

From the definitions, we realized that both ‘safety nets’ and ‘social protection’ have similar objectives of helping the poor and reducing their vulnerability to various shocks. Safety nets are often identified in the literature as short term buffers, while social protections are considered longer term interventions. Holzmann and Jorgensen (2000) considered SSN as a subset of SP when social protection is perceived to include labor

market intervention, social insurance and social safety nets. But many authors did not accept their definition as perfect.

The SSN of the government of Bangladesh, several INGOs and local NGOs are as follows:

1. Cash transfers: Old age Allowances, Allowance for Retard or Disable Person, Allowance to the Widowed, Deserted and Destitute Women, Honorarium Programme for the Insolvent Freedom Fighters, Primary education Stipend Project, Female Secondary School Assistance Programme and so on.
2. In-kind transfer: Vulnerable Group Feeding Programme, Vulnerable Group Development, Gratuitous Relief, Test Relief, Food for Works, Community Nutrition Program and so on.
3. Emergency relief operations or its school feeding programme.
4. Price subsidy: Fertilizer and Electricity Subsidy, Subsidy for Marginal Farmers to cope with the Fuel Price Hike, Food Subsidy.
5. Jobs on labor-intensive public works: Rural Employment Opportunities for Public Assets, 100 days Employment Generation Program and so on.
6. Fee waivers: Free schooling, health card.
7. Programmes in development sectors (some of which may have been wrongly included in the group).
8. Open Market Sales (OMS), which is not considered a transfer of food, but provisioning of a service (in trading of food grain) at less than market price.
9. Others Special programmes: Housing for the Homeless, Microcredit for Women Self-employment, Rehabilitation Programme for Beggars and Alternative Employment Project for Beggars.

The government of Bangladesh has been increasing unconditional cash transfer programmes, including old age pensions, widow allowances and disability allowances. It has also increased the budget for women and child welfare and introduced an Allowance for Lactating Mothers about Tk. 216 million as a new pilot program. SSNPs' redistribute resources to the poor to reduce their economic hardship, which include any direct transfers to the poor, whether in cash or in kind, made with or without a work requirement (Smith and Subbarao, 2003). The objectives of SSN are as follows:

1. Programmes may be designed to develop infrastructure and to create employment generations.
2. Provide education incentives to the poor.
3. To cope the consequences of disaster.
4. Provide livelihood support to disadvantaged groups such as the aged and the disabled.
5. Incentives provided to the families to improve their health status.

The poor households who are deprived from SSN and

SP take various activities to face the food price hike situation at present and future and these are as follows (Zohir et al., 2010):

Short-term strategies: Increasing income by engaging in extra laboring activities as well as by working more hours. In addition, many sold cows, goats, hens and ducks. Instances of spending from past savings, curtailing expenses were also reported.

Mid-term strategies: It involved children and wife in work, mortgaged house or lands. Stop taking NGO loans, send one or two children to stay with better-off relatives, temporary migration from rural areas to urban areas, and grow vegetables and other trees in farmhouse lands.

Long-term strategies: Migration for better opportunities with higher income, adapted family planning as families with higher members had to suffer most, few opened insurance for their children or for themselves, provided training to children so that they can face the shock in future.

In 2007–2008 during the food price hike Bangladesh Rifles's (BDR) *Dal-Bhat* (Pulses-Rice) programme were undertaken as an SSNP and expanded the open market sale (OMS) of food grains at subsidized price. Subsidized rice was provided to the tea garden workers under Leading Economic Indicators (LEI) component of the Public Food Distribution System (PFDS).

FOOD AND CASH TRANSFER PROGRAMMES IN BANGLADESH

The objectives of the food and cash transfer programmes for improving the food security and livelihood of the ultra poor in Bangladesh are as follows:

1. To establish the relevance of food and cash in enhancing food security of the ultra poor, especially women and children, in a sustainable fashion through overall improvements in livelihoods, so that the poor and disadvantaged people can tackle the poverty effectively.
2. Employment generation through micro-credit and different fund management programmes.
3. To inform and guide the ongoing SP policy formulation exercise.
4. To guide the formulation of effective programme implementation strategies for the World Food Programme (WFP) in Bangladesh.
5. Provision of education, health and training to make the new generation more capable and self-reliant.

In the 1970s and 1980s, much of the food aid was sold at subsidized prices through the Public Food grain Distribution System (PFDS). In the late 1980s and early 1990s, major reforms were initiated in the food assisted programmes in Bangladesh to improve targeting of

subsidies and reduce leakages. Statutory Rationing (in urban areas) and Palli Rationing (in rural areas) were terminated in the early 1990s, and a new major targeted channel, Food for Education, was introduced in 1993.

The national and international organizations for food-based programmes select an *inferior* food for distribution to the poor. An inferior food is one that is consumed by the poor but not preferred by the wealthy. For example, in Tunisia and Semolina, durum wheat pasta, has been subsidized because it is consumed disproportionately more by the poor than by the rich (Tuck and Lindert, 1996). For similar reasons, barley has been subsidized in Korea, coarse rice in the Dominican Republic (Alderman, 1991), and coarse *baladi* bread in Egypt (Ahmed et al., 2001).

Infrastructure and construction programmes

In Bangladesh, infrastructure and construction programmes for SSN are Food for Work (FFW) or Rural Development (RD) programmes, the Food for Asset Creation (FFA) component of the Integrated Food Security programme, and Test Relief (TR) distribute food grains (rice and wheat) as wage payments to workers in labor-intensive public works programmes. Both men and women participate in FFW and TR, whereas in FFA at least 70% of the participants must be women. Only women can participate in Rural Maintenance Program (RMP), which offers cash wages for maintaining rural earthen roads. All these programmes require the participants to do physical work that mainly involves moving earth, where only the neediest of the rural areas are employed.

The FFW programme has been operating in Bangladesh since 1975 in response to the 1974 famine. FFW (RD) components implemented by Cooperative for Assistance and Relief Everywhere (CARE) started using cash as its focus shifted from earthwork to create structures on roads, including culverts to facilitate safe flow of water. The aim of the programme was to provide relief for the poor facing severe food insecurity, using food resources donated to the country. The main objectives of the programme are as follows:

1. To improve the performance of the agriculture sector through the construction and maintenance of infrastructure for production and marketing.
2. To reduce physical damage and loss of human life due to floods and other natural disasters through appropriate protective structures.
3. To generate productive seasonal employment for the rural poor.

Rural education programmes

In the Food for Education (FFE) programme, food grain

ration is distributed monthly to poor households if they sent their children to primary schools. FFE was ended in 2002 and has been replaced by the cash-based Primary Education Stipend (PES) programme. Another programme is the School Feeding (SF) distributes biscuits prepared with energy-producing micronutrients to primary school children. The objective of all these programmes is to promote school enrollment and attendance and reducing dropouts of the rural children and mitigate micronutrient deficiency. GoB also provides cash assistance to all girls in secondary schools through the four components of the Female Secondary School Assistance Programme.

Relief programmes

In these programmes, the beneficiaries does not need to do any physical work and only apply during the natural disasters, such as floods, cyclones, and other natural calamities. At present, there are only two such programmes in Bangladesh:

- a. The Vulnerable Group Feeding (VGF) and
- b. Gratuitous Relief (GR) programmes.

The VGD programme

The VGD programme in Bangladesh is the largest in the world that exclusively targets women. More than 750,000 ultra-poor rural women in the country received support under the VGD programme in 2006 (Ahmed et al., 2009a). It is a collaborative food security intervention jointly managed and implemented by GoB and WFP. It first began in 1975 as a relief programme for families affected by natural calamities. At present, it provides food security and nutrition with development and income generation. The VGD programme's beneficiaries are selected by administrative review using *upazila*-level committees of government officials; union *parishad* members, elected representatives of local government; and partner NGO representatives. The selected household should meet at least four of the following five criteria (Ahmed et al., 2009a):

1. The household consumes less than two full meals per day.
2. It owns no land or less than 0.15 acres of land.
3. It has very poor housing conditions (construction material and sanitation facilities).
4. It has an extremely low and irregular family income from daily or casual labor.
5. It is headed by a woman with no adult male income earner and no other source of income.

Of the 750,100 women served by VGD, 640,721 women

(85.4%) and their family members received Income-Generating Vulnerable Group Development (IGVGD) support and 109,379 women (14.6%) and their dependents received support under the Food Security Vulnerable Group Development (FSVGD) component in 2005-2006. The FSVGD project began in July 2001, and project activities ended on 2006. FSVGD programme provides a combination of food and cash to programme participants. Monthly entitlements are a 15 kg sealed bag of micronutrient fortified *atta* (whole-wheat flour) and Tk. 150 per beneficiary. The European Commission (EC) funded the provision of cash allowances to programme participants and WFP and bilateral donors, including GoB and several NGOs, provided food assistance to FSVGD (Ahmed et al., 2009a).

The IGVGD programme exclusively targets poor women, who receive a monthly food ration. Each participant is entitled to receive either 30 kg of rice or 30 kg of wheat or a 25 kg sealed bag of micronutrient fortified *atta* per month. Of the total 460 *upazilas* (sub-districts) of Bangladesh in 61 districts, FSVGD operated in 57 *upazilas* in 7 districts in northern Bangladesh and IGVGD operated in 364 *upazilas* in 54 districts. VGD participants receive the assistance over a period of 24 months. A household can have only one VGD card. The selected VGD cardholder woman should be physically and mentally sound and must be from among the most vulnerable and poor households in the union.

Food for Asset Creation (FFA) and Rural Maintenance Programme (RMP)

The FFA component has been designed to promote human and capital resource development for the ultra poor by providing awareness and training in legal, social, health, and nutrition issues; by enabling participants to work for community infrastructure development and productive asset creation; and by providing marketable skills training for income-generating activities (IGAs). Both women and men participate in FFA, but at least 70% of the participants must be women. Participants in the FFA component receive food and cash compensation from December to May and it follows a one- to two-year project cycle.

Each FFA participant in the building of community infrastructure and assets is entitled to receive a minimum wage of 2 kg of rice or wheat and Tk. 15 per working day, on the condition to accomplish a minimum amount of work. FFA participants are required to save Tk. 25/month. In 2006, FFA covered 39,200 participants in 38 *upazilas*. The FFA participants are selected depending on the following criteria (Ahmed et al., 2009a):

1. Individuals who depend predominantly on manual or casual labor, have extremely low or irregular income, and

- do not operate and are not employed at a business.
2. Those from households that do not own or operate more than 0.15 acres of land.
3. Those who are physically fit to carry out the scheduled work.
4. Those from households with malnourished pregnant or nursing mothers and/or children of school-going age who are often engaged in paid work.
5. Female heads of households (women who are widowed, separated, divorced or deserted, or have disabled husbands).
6. Individuals from households with virtually no productive assets.
7. Those in households with no more than one participant.
8. Those who are not under aged or over aged (the recommended age group is 18–50 years).

In 1983, the Cooperative for Assistance and Relief Everywhere (CARE) initiated the RMP as a cash-for-work road maintenance project on a pilot basis in 7 unions of 7 districts. In 2006, it expanded and operated in 4,200 unions in 61 districts across rural Bangladesh, employing 41,540 women. RMP provides destitute (divorced, widowed, separated or abandoned) women with four years of employment maintaining rural roads. Each RMP woman is entitled to receive a wage of Tk. 51/day, of which she is required to save Tk. 10/day (Ahmed, 2005). A RMP woman finds monthly salary of Tk. 1,230 through the bank after the deduction of mandatory savings. The deducted Tk. 10/day is transferred to each individual's savings account. The women can withdraw their savings only after completing the four-year cycle and each woman can accumulate an amount of Tk. 7,000 and with this amount they can be benefitted to become self dependant. RMP women are selected for road maintenance depending on the following criteria:

1. The women are divorced, widowed, or abandoned.
2. They are predominantly single heads of households.
3. They are young, 18-35 years, with children.
4. They are physically and mentally fit to do road maintenance work and receive life management training.
5. They are illiterate, having had little or no schooling.
6. They and their families are well below the extreme poverty line.
7. They are unable to provide their families with three balanced meals daily.
8. They have few assets and may be landless and without their own shelter.
9. They are forced to seek irregular, short-term work at low wages.

The RMP households spend relatively more on food than households in other programmes. By this project, the rural communities benefitted from good roads, and poor

women benefitted from improved standards of living for themselves and their other family members.

One hundred days Employment Generation Programme

In the FY 2008-2009, for the first time, the government has introduced 100 days Employment Generation Programme (EGP) in Bangladesh. It has estimated to ensure employment opportunity to those who remained unemployed in lean season, especially in the Monga prone area of the northern part of the country. It is an additional attempt with all other food for work programme prevailing in the country. When it starts, it is estimated that more than 20 lakh unemployed people would be guaranteed to be employed under these programmes (Ahmed et al., 2009b).

In Bangladesh more than 40% of the total populations are living below the poverty line. It is true that the GoB and other national and international NGOs are working for the poor. But these PFDS under various programmes are covering only few hundred thousand people that would not be sufficient enough to combat with food insecurity in Bangladesh. On the other hand, proper implementation, distribution and delivery of these programmes often remain questionable always. It is frequently seen that from the some Member of the Parliament (MP) to the grass root level union parishad members theft the relief materials. Sometimes relief materials go to the well to do families who are the relatives of the masterminded persons.

In Bangladesh, most of the ongoing programmes are to feed only few of the poor and the extreme poor, which have so far contributed little to reduce poverty. In addition, the lower income and middle income group which have been inflicted on the wake of recent food crisis poses another dimension of threats.

Poverty Reduction in Bangladesh

In Bangladesh, during 2000 to 2005, income poverty reduced from 48.9 to 40.0% (Bangladesh Economic Review, 2008) and 2005 to 2010 reduced from 40 to 31.50% (HIES, 2010). The present government has targeted to reduce poverty rate to 25 and 15% by 2013 and 2021, respectively. The incident of poverty, using Cost of Basic Needs (CBN) method, at national level declined from 58.50% in 1983 to 48.90% in 2000 based on upper poverty line. During this period, the compound poverty reduction rate per year is recorded at 1.8%.

When most of the countries faced the effects of global economic crises, Bangladesh has acquired higher GDP growth rates compared to the previous years. In 2012–2013, the GDP of Bangladesh reached 6% that is close

to the developing countries (China and India are estimated to have rates of 8.8 and 7.3% respectively).

The foreign currency reserves of Bangladesh have increased to \$10.19 billion in April 2012 after the first installment of the IMF loan was disbursed under the Extended Credit Facility (ECF) arrangement. But it (foreign currency reserve) is also volatile in the country. The fall in foreign currency reserves causes a very steady depreciation of the taka against the US dollar and some other currencies, such as euro, pound, etc. The taka has depreciated by over 12% in FY 2011–2012, thus further increasing the dollar amount of import, debt servicing and interest payments.

On the other hand, the tax revenues exceeded a record about 10% of GDP in FY 2011. Borrowing of the government became more than doubled over the 2010 to 2011 leading to concerns of higher inflation in the economy and due to a large spending on subsidy in the power and energy sectors and on social safety net coverage. The loans to the government from the commercial banks and central bank have reached about \$1.96 billion in FY 2011. From the commercial banks alone, the government has borrowed around \$1.3 billion. The government borrowing created various problems for the economy as follows:

1. The increased borrowing may force up interest rates and crowd out private sector investment in the country.
2. If this borrowing trend continues, the government may need to increase the tax burden in the long run.
3. The increase in national debt would mean that the annual interest payments will rise.

CONCLUSIONS

This study focuses on the food and nutrition of Bangladesh. It is one of the densely populated developing countries of the world. Budget in family planning must be increased to control population growth. Application of laws against child marriage must be strict to build a healthy and safety mother community. The GoB should apply the modern agriculture technologies to develop the country in agriculture. Natural calamities are also obstacles of the economic development and government should increase employment programmes instead of relief for the natural disaster affected people. The government must reduce the political instability and increase continuous energy supply. The food price inflation must be controlled for food security of the destitute. GoB must increase budget in research and development projects of food and agriculture sector. Irrigation system must be increased to produce more food in dry season and electricity supply must be increased in irrigation sector. GoB should take steps to distribute solar pumps with low prices for irrigation. Modern and new

technologies must apply for storing rainwater for the dry season. New and genetically modified crop production must be increased to make country self sufficient in food.

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