# Present Status and Sustainability of Food Security in Bangladesh

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#### Abstract

Based on national level data from secondary sources and particularly HIES (1991-2005), food security was measured and compared between rural and urban areas by using three major indicators such as food availability, food access and food utilization. The aggregate food availability and consumption depend on domestic production and import and public food distribution on the one hand and prices, income and consumers' preference on the other. Rice is consumed more in quantity in rural areas than in urban areas but wheat consumption is very common in urban areas. Other than rice, all food items are consumed more in quantity in urban areas than in rural areas. Again, in urban areas average calorie (2193 gm) and protein (64.88 gm) intake are slightly higher compared to rural areas. In urban areas, the intake of calorie and protein showed ups and down over the period 1990-2005. Rice is the single major source and on average it contributed about 71 percent to total calorie intake. The contribution of cereals to total calorie intake is somewhat higher for rural people than for urban people. Moreover, among many other indicators of determining the food security, calorie and protein intake are considered as key determinants. Accordingly, the major thrust of policy, planning and evaluation efforts should be directed towards assessment of adequacy of food and to improve the average calorie and protein intake of masses as well as different classes of people.

#### 1. Introduction

In Bangladesh, the challenge to maintain food-population balance is great because practically all cultivable land is in use. There is little scope to expand the land

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frontier. The pressure of increasing population reduced the average size of farm holding from 1.70 to 1.48 acres in the period 1996-2005 (BBS, 2008). The growth of crop production now depends almost entirely on technological progress and intensive farming by introducing better management for all food crops and other enterprises to be produced. The country also faces a difficult distribution problem in order to achieve food security for all groups in society. About 20 percent of the rural households have no cultivable land and another 38 percent have less than 0.5 acre (BBS, 2005), which cannot be a significant source of employment and income for the household. The bottom half of the population depend on the market for food, on which they spend nearly 60 percent of their income (HIES, 2005). Thus, maintaining a proper balance between food prices and income of the rural people is very important for providing incentives to food production and achieving food security for the poor.

Bangladesh economy is still agro-based and characterized by low income of the people, low resource base and highly prone to natural disaster. As a result, a large number of people cannot afford subsistence level of income for meeting their basic needs, thus living below the poverty line.

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For the last three decades, the Government of Bangladesh has endeavored to improve the quality of life of the people through planned development efforts and by reducing the poverty. As an outcome of the development activities, Bangladesh has made commendable progress in terms of reduction of income and human poverty and has received universal appreciation for attaining success in alleviation of human poverty in education, health and nutrition and also has achieved the targets of Millennium Development Goals (MDGs) (WB,2007).

With the intensive and integrated farming, total food grain production has been showing an increasing trend over the last two decades (33.74 million metric ton in 2007-08). It produced major agricultural crops such as rice, wheat, jute, potato, pulses, oilseed, sugarcane, tea and tobacco. Tea, leather and frozen shrimp are also major foreign exchange earners. There has been a rapid growth in manufacturing industries which offer a wide range of exportable goods such as leather goods and

readymade garments. Since total population is increasing day by day, the total agricultural production is not sufficient to meet domestic consumption. That is why the government is importing large amounts of food grain (2.0-3.0 million tons) almost in every year along with some manufactured goods and consequently the balance of trade is going increasingly negative (BER, 2007). On the other hand, through intensive culture and management, the country is increasing food production to have greater food security and the country is approaching better livelihood and socioeconomic condition. In such an improving livelihood condition, food security and its sustainability need to be addressed in Bangladesh.

Food security is defined by USAID as follows: "When all people at all times have both physical and economic access to sufficient food to meet their dietary needs for a productive and healthy life". By this definition, food security is a broad and complex concept which is determined by the interaction of a range of agrophysical, and socio-economic and biological factors. Like the concepts of health or social welfare, there is no single, direct measure of food security. Measurements and assessment methodologies and methods can differ considerably, even within the boundaries of the qualitative and quantitative traditions. However, the complexity of food security problem can be simplified by focusing on three distinct, but inter-related dimensions of the concept: food availability, food access and food utilization.

#### 2. Sources of Data

The persent study is concerned with food production and consumption, and as well as food security aiming to determine food intake and nutritional status of different levels of people living in urban and rural areas of Bangladesh. Present status and sustainability of food security are assessed by using data from HIES. Socioeconomic factors (indicators) and possession of different livelihood assets might have impact on food security and its sustainability.

The study is mainly based on desk research, and data and information were obtained from the secondary source. However, following reports and research materials were used to prepare this paper and to address the objectives of this study:

- Household Income and Expenditure Survey Data on 1995-96, 2000 and 2005.
- Statistical Year Book of Bangladesh, Bangladesh Bureau of Statistics, 1988-2005.

- Related research reports and journal articles on food security and poverty reduction, 2001-2008.
- Internet and Website searching.

### 3. Present Status and Sustainability of Food Secutity

Overall food consumption and the consequent nutritional status of the population of Bangladesh is determined by the interplay of a number of factors such as domestic production, internal procurement, imports and public food distribution on the one hand and prices, incomes and consumers' preferences on the other. Although aggregate food availability is determined by domestic production and imports, public food distribution is considered to play an important role in modifying the availability of food to different sections of the population. The impact of public food distribution on food availability and consumption of different economic and social classes of people needs to be examined and quantified. On the other hand, given the level and composition of food consumed, whether or not, or to what extent nutritional requirements are fulfilled is a pertinent question which has been inadequately researched. A number of sources provide evidence on different levels and trends of food consumption, calorie intake and requirements.(BAN-HRDB2007, Bhatacharjee et al. 2007, Kashem et al., 2004).

### 3.1 Domestic Production and Import of Food Grain

Bangladesh has made a remarkable progress in the production of major agricultural crops and is approaching food self-sufficiency. Although aggregate domestic production of foodgrain has more than doubled during the last three decades, population growth has outstripped the rate of growth of food production and as a result, per capita availability of grains from domestic sources has declined. Per Pinstrup Andersen (1994), Director General of IFPRI, in his foreword message in report no. 98 claimed that for many years Bangladesh depended heavily on food aid, but recently it has emerged as a country approaching self-sufficiency in rice, the main staple food of its population. Rice output grew at a rate of 2.74 percent in the year 1980-2004 but it grew at a rate of 3.15 percent in the year 1990-2004. It has the similarity with the findings of Goletti (1994). Which mentioned that production of rice, the major staple food of the country, grew at a rate of 2.7 percent in the 1980s versus a population growth of 2 percent. Table 1 shows the scenario of the domestic production and import of food grain during the period 1998-99 to 2007-08. In each and every year,

Bangladesh had to import food grain to meet the deficit of food requirement and it has increased since 2002-03. However, production of rice is 31.97 million m.tons in 2007-08 whereas it was 22.73 million m.tons in 2006-07. The production of wheat is 0.96 million m.tons in 2007-08 whereas it was 0.74 million m.tons in 2006-07. Production of wheat has received increased attention both from policy makers and producers. From the government point of view, wheat production is encouraged to replace imports because wheat constitutes a major part of foodgrain imports and thus commands a major share of scarce foreign exchange. Wheat consumption is also encouraged on nutritional grounds, especially as a cheap source of calories and protein. Besides, wheat production in Bangladesh has a substantial agronomic and economic potential. Wheat is grown during the dry months of the year. Total input requirements including irrigation water is much lower for wheat than for rice.

One of the remarkable features is that the negative growth rate was observed in the production of pulses, an important source of protein for the low-income group. The decline in the production of pulses is attributed to a shift of land away

Table 1: Domestic production and import of food grain in Bangladesh, 1998-2008

Year	Rice (mmt)	Whea (mmt)	Maize (mmt)	Total (mmt)	Share of rice total food grain (%)	Total import of food grain (mmt
1998-99	19.905	0.1908	-	21.81	91	5.21
1999-2000	23.067	0.1840	*	24.91	92	2.10
2000-01	25.087	0.1670	0.0149	26.91	93	1.56
2001-02	24.300	0.1606	0.0152	26.06	93	1.80
2002-03	25.188	0.1507	0.0175	26.87	94	3.22
2003-04	26.190	0.1253	0.0241	27.64	94	2.80
2004-05	25.157	0.0976	0.0356	26.49	95	3.37
2005-06	26.553	0.0735	0.0522	27.79	96	2.56
2006-07	27.321	0.737	0.065	28.112	97	2.42
2007-08	31.97	0.956	0.817	33.743	95	3.47

Sources: BBS, 2008 and Data base on Food situations (FAO), 2008

from pulses to high yielding varieties of rice and wheat which enjoy a comparative advantage in production resulting from the seed-fertilizer technology of the green revolution. It appears from the report (BBS 2008) that the production of pulses in 2006-07 was 0.25 million m.tons whereas it was 0.33 million m.tons in 2003-04.

## 3.2 The Public Food Distribution System

With a current annual distribution of about 1.5 million metric tons and an average stock level of about 1.0 million metric tons of foodgrains, the Public Food Distribution System (PFDS) plays an important role in the food and agricultural sectors of Bangladesh. The main objectives of the PFDS are to (1) make foodgrains available to poor households that would not otherwise have access to adequate food, (2) distribute food during emergency situations, such as natural disasters, (3) provide incentive prices to foodgrain producers to encourage domestic production, and (4) stabilize market prices to prevent excessive price rises.

Public food distribution system (PFDS) was initiated to increase access to food for the vulnerable group through price subsidies on food grain. PFDS contributed a lot to mitigate the food crisis of the vulnerable poor. Table 2 shows the allocation and distribution of cereal food for the vulnerable poor during the period

Table 2: Off-take of cereals from the public food distribution system and the share directed to the poor, FY1998-FY2007

Year	Total PFDS (000 m.tons)	Programs for the poor (000 m.tons)	Share of off-take for the poor (percent)
1998/99	2120	1874	88.4
1999/00	1900	1609	84.7
2000/01	1774	1506	84.9
2001/02	1464	1209	82.6
2002/03	2134	1874	87.8
2003/04	1434	791	55.2
2004/05	1367	863	63.1
2005/06	1245	899	72.3
2006/07	1462	758	51.8
2007/08	860	568	66.0

Source: Food Planning and Monitoring Unit (FPMU) of the MoF, 2005 and MoFDM, 2009

FY1998/99 to FY2007/08. It may be noted that both amount and share of off take for the poor have decreased since 2004/05 and it continued upto 2007/08. Bangladesh Agricultural Research Council (2000) surveyed food grain markets, PFDS and food procurement centers and observed the following problems of the procurement system which included: deception in weight, extra payment, higher transportation cost, time delay, non-acceptance of paddy, political pressure, anomalies in slip distribution, delayed payment, shortage of crushing mill, late

procurement and inadequate storage facility that hindered the target of procurement particularly in some places of Bangladesh.

Besides procurement, PFDS is beset with many difficulties. The amount of food distributed under PFDS was inadequate and insufficient in comparison to the vast need of the poor. The system of public food distribution was faulty, where nepotism and corruption were found in the selection process as well as leakage and manipulation in distribution was high. Often the quality of food grains distributed by this system was bad.

Bangladesh also has received universal appreciation for attaining success in alleviation of human poverty in education, health and nutrition. Report on HIES 2005 of BBS shows downward trend in income poverty. According to Cost of Basic Needs (CBN) Method, the incidence of poverty at national level declined from 48.9 percent in 2000 to 40 percent in 2005, the incidence of hard-core poverty also showed a declining trend during the same period. However, along with the Poverty Alleviation Program; Bangladesh Government initiated Social Safety-Net Program (SSNP) for different levels of people mainly to contribute to the welfare of the poor and also the underprivileged community. In addition to allocation in the ADP, Tk. 4600 crore was allocated from the non-development budget for the fiscal year 2005-06 for targeted poverty reduction and employment generation (BER 2007).

## 3.3 Food Consumption and Nutritional Status

Food consumption: The food consumption pattern represents the type, quantity and composition of food consumed in a given culture. It also reflects the relative importance of different foods in the total diet. The knowledge of food preference and consumption pattern is essential in using and interpreting market parameters for analysis and formulation of food policies in a given context. It is also important to know how individual foods are combined to make a given meal. The typical preferred consumption pattern in rural Bangladesh, for example, is three meals in a day each with rice, supplemented by vegetables, curry (with fish or meat) and/ or pulses. In recent times, wheat consumption has increased substantially.

In urban areas, wheat consumption is more common and people in general eat breakfast with homemade or purchased bread prepared from wheat flour. Increased wheat consumption in urban areas is attributable to the greater incidence of public distribution of wheat in urban centres. Urban people have more exposure to information about better diet and are relatively more motivated to consume wheat on both economic and nutritional grounds.

It is difficult to identify a typical consumption pattern because both volume and composition of foods vary according to economic and social status of people. Perhaps the best possible way to ascertain the consumption patterns of the classes of people is to conduct properly designed food consumption surveys. The preliminary report on Household Income and Expenditure Survey (HIES) 2005 of Bangladesh obtained detailed information on quantities of various food items consumed by rural and urban people. A detailed list of the items and quantities of different foods consumed by the rural and urban people is presented in Table 3.

It appears from Table 3 that rice is consumed in sufficiently more quantity in rural area than that of urban. In 2005, average quantity of rice per capita per day was estimated at 459.71 grams in rural area, where the same was 378.53 grams in urban area. Almost the same pattern was recorded in 2000, that is, 478.84 grams per capita per day in rural area and 372.66 grams in urban area. Other than rice, all food items were consumed more in quantity in urban area than in rural area in

Table 3: Average per capita per day intake of major food items (in grams) by rural and urban

		200	)5		2000	
Food Items	Rural	Urban	National	Rural	Urban	Nationa
Total	946.32	952.10	947.7	898.68	870.67	893.1
Rice	459.71	378.53	439.6	478.84	372.66	458.5
Wheat	7.99	24.52	12.1	14.00	30.12	17.2
Potato	61.93	67.48	63.3	54.71	58.38	55.0
Pulses	12.74	18.63	14.2	14.97	19.04	15.6
Vegetables	156.47	158.68	157.0	141.11	137.92	140.5
Edible oil	14.33	22.92	16.5	11.24	19.11	12.8
Onion	16.11	25.26	18.4	14.08	20.72	15.4
Beef	6.41	11.97	7.8	6.87	13.98	8.3
Mutton	0.57	0.66	0.6	0.43	0.71	0.5
Chick &duck	6.11	10.63	6.8	3.52	8.41	4.1
Egg	4.41	7.41	5.2	4.61	7.89	5.2
Fish	39.70	49.57	42.1	37.83	40.89	38.5
Milk	31.03	36.55	32.4	28.99	32.59	29.7
Fruits	32.42	32.90	32.5	26.53	35.63	28.4
Sugar	7.54	9.73	8.1	6.37	8.78	6.9
Miscellaneous	67.01	68.63	2	54.58	54.86	-

Source: HIES, 2005.

2000. Although vegetables constitute the second major item, it is in fact a food group consisting of some roots and tubers( excluding potato) and the whole range of leafy and other vegetables.

Calorie intake: Consumption of different levels and composition of food does not mean much except that it satisfies instant and apparent hunger and meets possibly some social and psychogenic needs. A more objective basis of food consumption is the improvement and for maintenance of nutritional status which, of course, is determined by the level and composition of food intake. A distinction needs to be drawn because a relatively greater volume of food may mean a lower nutrition level while the same volume consumed by different persons may yield varying levels of nutrition depending on what people eat, given their social, economic and cultural constraints. The relevant question now arises as to what constitutes nutritional status and how it is affected by different levels and composition of food intake.

In terms of nutrients, the physiological requirements of the human body are protein, energy, vitamins and minerals. Energy, normally measured in calories, is provided mostly by carbohydrates and occasionally by fats and proteins. Within the broad categories of nutrients there are varying numbers and types of constituent elements which, through their complex interactions, determine the overall nutritional status. In a composite sense the state of nutrition of a person is expressed through concepts like under nutrition and malnutrition. Average intake of calorie in different survey years are presented in Table 4 with urban-rural breakdown.

Average calorie intake was estimated at 2238 k.cal per capita per day in 2005, where as it was 2240 k.cal, 2244 k.cal and 2266 k.cal in 2000, 1995-96 and 1991-92 respectively. It shows a gradual decreasing trend over the years. This may happen, due to growing awareness of people to take less calorie food items for health reason.

Table 4: Average per capita per day calorie (k.cal) intake by residence, 2005

Survey Years	Residence			
	National	Rural	Urban	
1991-92	2266	2269	2258	
1995-96	2254	2251	2209	
2000	2240	2263	2150	
2005	2239	2253	2194	

Source: HIES, 2005.

The pattern as noticed at the national level was almost followed in the rural area, in case of calorie intake. It was 2253 k.cal in 2005, 2263 k.cal in 2000, 2251 k.cal in 1995-96 and 2267 k.cal in 1991-92. In urban area, the intake of calorie shows ups and downs over the periods. It was 2193 k.cal in 2005, 2150 k.cal in 2000, 2209 k.cal in 1995-96 and 2258 k.cal in 1991-92. The overall declining trend of calorie intake per capita per day, although quantity of food consume is increasing, is directly related to the changing pattern of food consumption of the people, that is, gradual shifting from high calorie food to low calorie food.

An assessment of calorie intake of both rural and urban people according to sources is presented in Table 5. As is expected, rice is the single major source accounting for 70.9 per cent (national) on average of the total calorie intake. Cereals group has the maximum share to the total calorie intake. About 75.4 per cent of the total calorie comes from cereals. The contribution of cereals to total calorie intake is somewhat higher for rural people than for urban people. Wheat is the second major source of calories accounting for about 4.8 per cent of total calorie intake of urban consumers compared to about 2.1 per cent calorie intake of rural people. Among the non-cereals, potato, vegetable, pulses, milk, edible oil, fish, condiment and spices constitute about 19.5 per cent in 2000 and about 17.5

Table 5: Per capita daily calorie intake in percent by food items in 1995-96 and 2000

Food Items	Nati	National		Rural		Urban	
	2000	1995-96	2000	1995-96	2000	1995-96	
Total	100.0	100.0	100.0	100.0	100.0	100.0	
Cereals	75.4	78.0	77.1	79.7	68.5	69.2	
Rice	70.9	71.3	73.3	73.3	60.9	61.2	
Wheat	2.6	5.1	2.1	4.9	4.8	6.2	
Other	1.9	1.6	1.7	1.5	2.8	1.8	
Potato	2.4	2.0	2.3	1.8	2.6	2.6	
Vegetables	3.5	3.2	3.6	3.3	3.3	2.8	
Pulses	2.3	2.1	2.4	2.0	3.0	3.0	
Milk/Milk product	1.4	1.7	1.3	1.5	1.8	2.3	
Edible oils	5.2	3.9	4.5	3.3	8.0	6.9	
Meat, Poultry, Egg	1.0	0.9	0.9	0.7	1.9	1.8	
Fish	2.4	2.8	2.3	2.6	2.8	3.8	
Condi.& Spices	2.3	1.8	2.3	1.6	2.8	2.0	
Fruits	0.9	0.8	0.8	0.8	1.2	1.3	
Sugar/Gur	1.3	1.7	1.1	1.6	1.7	1.8	
Miscellaneous	1.7	1.3	1.5	1.0	2.6	2.5	

Source: HIES, 2000

per cent in 1995-96 at the national level.? In rural area this non-cereals group constitutes 18.7 per cent in 2000 and that 16.1 per cent in 1995-96. In urban area the corresponding figures are 24.3 per cent and 23.4 per cent respectively.

**Protein intake:** Protein intake in grams over the years presented in Table 6. It reveals that intake of protein over the years was almost static.

In the rural area, the intake of protein over the years ranges between 61.74 grams to 64.45 grams with a low intake of 61.74 grams in 2005 and a high intake of 64.45 grams in 1995-96. In the urban area, the intake ranges between 64.88 grams to 67.50 grams with a low intake of 64.88 grams in 2005 and a high of 67.50 grams in 1995-96.

Thus without undermining the importance of other essential and micro nutrients for attaining optimal nutritional balance, it can be said that calorie and protein

Table 6: Average per capita per day intake of protein (grams) by residence-2005

Survey Years			
	National	Rural	Urban
1991-92	62.72	62.29	65.49
1995-96	64.96	64.45	67.50
2000	62.50	61.88	64.96
2005	62.52	61.74	64.88

Source: HIES, 2005.

hold the key to the determination of nutritional status in Bangladesh. Therefore, the major thrust of policy, planning and evaluation efforts need to be directed towards assessment of adequacy and needs formulation of policies and programmes to improve the average calorie and protein intake of masses as well as different classes of people.

Socioeconomic indicators of food security: In most analyses of food security conditions in developing countries, multiple indicators are used to reflect the various dimensions of the problem. Some of the most commonly used types of indicators in the assessment of food security conditions are food production, income, total expenditure, food expenditure, calorie consumption and nutritional status etc. (Riely et al., 1999). Food security indicators are summary measures of one or more of the dimensions of food security used to demonstrate change or the result of a programme activity for a target population. Indicator construction begins with a set of observations, or measurements, of food security-related conditions at the level of the individual, the household, the community, the market

or the region (Riely et al., 1999). Bangladesh has made a remarkable progress in the production of major crops and is approaching food self-sufficiency. The country has still the potentiality of improving food production situation, food security, and other economic, social and demographic factors as evidenced by the different international organizations. European Union (2006) mentioned that Bangladesh has made major progress in improving the standard of living of its people over the past two decades. It has successfully reduced the fertility rate from 7 to 2.57 births per woman; infant mortality rates have fallen to 53 per thousand live births and life expectancy is about 65 years. The population growth rate fell from over 3 percent in the 1970s to 1.48 percent in 2005. Now the sanitary latrine user is 52.6 percent and that of safe drinking water user is 96.3% in Bangladesh (BER 2007, PRB 2006).

#### 4. Conclusion

This study determined the present status and sustainability of food security at national level and compared between rural and urban area with the help of three main indicators such as food availability, food access and food utilization.

Domestic production and import, and public food distribution determined the overall food consumption and the consequent nutritional status of the population. Although aggregate domestic production of food grain more than doubled during last three decades, almost in every year Bangladesh had to import 2-3 million mt of food grain to meet up the food deficit.

Rice is consumed sufficiently more in quantity in rural areas (459.7 gm/capita/day) but other than rice, all food items are consumed more in urban area than in rural area. Rice is the single major source accounting for about 71 percent (national) on average of total calorie intake. The contribution of cereals to total calorie intake was relatively higher for rural people than for urban people.

Among the non-cereals, potato, vegetables, pulses, edible oil, fish, condiment and spices constitute 18.7 and 24.3 percent to total calorie intake for rural and urban people, respectively. Along with food consumption, calorie and protein intake are two main indicators to determine the food security for all level of people. In urban area, the average calorie (2193 gm) and protein intake (69 gm) were relatively higher compared to rural area. The corresponding amount consumed in rural area was 2253 gm and 61.74 gm respectively. In urban area, the intake of calorie showed ups and down over the period 1990-2005. It was observed that both in rural and urban area, average calorie intake had a gradual decreasing trend over the years. This might happen, due to growing awareness of people to take less

calorie food items for health reasons. However, calorie and protein are considered as key determinants for food security. Therefore, all possible steps and measures should be taken by the policy makers to assess the adequacy of food and to improve the average calorie and protein intake of masses as well as different classes of people.

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