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**Rationalizing Food Demand and Supply
Estimates: An Exploratory Note**

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Rationalizing Food Demand and Supply Estimates:
An Exploratory Note*

Despite the declining relative importance of agriculture (which is dominated by food grains production, especially rice) in GDP, domestic production of food grains plays an important role in ensuring food security for the population and maintaining socio-political stability in the country. In order to assist in programming food grains availability to meet consumption requirements, the Food Planning and Monitoring Unit (FPMU) of the Ministry of Food and Disaster Management prepares food budget for the country on an annual (fiscal year) basis considering the availability (domestic production and imports) and consumption requirements of food grains (rice and wheat). This note examines the current methodology of setting the requirements and availability of food grains used by FPMU and identifies areas where efforts are needed to rationalize demand and supply estimates of food grains in the country. This is an exploratory note with the aim of identifying the issues, many of which require in-depth analysis and coordinated actions by relevant institutions and ministries. The issues are important, especially in view of the urgent need to rationalize food grains demand and supply estimates to ensure more credible planning of food grains production and availability in the context of rising prices in both domestic and international markets.

1. Estimates of Food Demand

The total demand for food grains in the country has several components; including consumption requirements and demand for stock.

1.1 Consumption requirements

The official estimate of food grain requirements (consumption) is prepared by FPMU. This is computed over the fiscal year (FY) using a simple methodology:

$$TFR_t = FRPCPD \times POP_t \times 365$$

Where TFR_t = Total food grains requirement in fiscal year t
$FRPCPD$ = Food grains requirement per capita per day
POP_t = Mid-year population in year t

Currently, FRPCPD is set at 17.25 oz (15.30 oz of rice and 1.95 oz of wheat) which is equivalent to 489.04 gm.[1] The estimate of mid year population is taken from BBS. Based on the above methodology, total food grain requirement comes to 25.5 million metric tons in FY08 (rice 23.1 million metric tons and wheat 2.9 million metric tons) whereas the production (rice and wheat) target is 28.9 million metric tons and estimated import (including food aid) is 3.4 million metric tons.

For the above methodology, the assumed values of two parameters are important in ensuring the credibility of estimated requirements. These are: (i) food grains requirement per capita per day; and (ii) mid-year population.

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[1] The amount is assumed fixed for all population with no differentiation in terms age, sex, or residence (rural/urban).

Food grains requirement per capita per day

In the estimate of total food grains requirement, the important question is: Is the assumed value of per capita requirement realistic? We shall try to examine the issue from two alternative perspectives: first, desired or recommended dietary pattern; and second, actual intake as revealed in survey data.

Recommended level of food grains consumption

In the case of recommended dietary pattern, FAO recommends that, for balanced nutrition and healthy life of an individual, the maximum proportion of dietary energy supply from cereals should not exceed 60 percent (FAO 2007).[2] If we use the FAO recommendation of 60 percent energy supply from cereals, then the desired levels of cereals consumption can be seen in Table 1. This shows that the current level of per capita intake of food grains assumed in calculating total food grains requirement in the country is much higher than the recommended level for balanced nutrition.[3]

Table 1: FAO recommended level of food grains consumption

Energy requirement target	Required quantity (gm/day) per person using 60 percent contribution of cereals to dietary energy
Absolute poverty line (2,122 kcal/capita/day)	365
FAO recommended level (2,400 kcal/capita/day)	414
Nationally recommended level(2,350 kcal/capita/day)	405
HIES 2005 consumption level (2,238 kcal/capita/day)	386

Source: Bangladesh Food Situation Report, October-December, 2007, FPMU.

Actual level of food grains consumption: HIES data

In 2005, the average level of per capita intake of rice was 439.6 gm at the national level; varying between 459.7 gm in rural areas and 378.5 gm in urban areas. In the case of wheat, similar quantities were 12.1 gm at the national level with 8.0 gm in rural areas and 24.5 gm in urban areas. Table 2 gives the per capita cereal (rice and wheat) consumption in 2000 and 2005. The data shows a decline, somewhat steeper in rural areas relative to urban areas, in per capita cereal consumption between 2000 and 2005. The consumption of wheat declined in both rural and urban areas; while rice consumption declined in rural areas but increased marginally in urban areas. The level of cereal consumption is higher in rural areas than in urban areas. The rural-urban differential, however, came down from 19 percent in 2000 to 16 percent in 2005.

Table 2: Per capita cereal consumption

(kg. per month)

Year	National			Rural			Urban		
	Total cereal	Rice	Wheat	Total cereal	Rice	Wheat	Total cereal	Rice	Wheat
2000	14.6	13.8	0.5	15.1	14.4	0.4	12.7	11.3	0.9
2005	14.1	13.2	0.4	14.6	13.8	0.2	12.6	11.4	0.7

Source: HIES 2005

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[2] As compared to this, the actual contribution of cereals to total dietary energy supply (calorie intake) is 73 percent (75 percent in rural areas and 67 percent in urban areas), with the contribution of rice alone at 68 percent. See Report of the Household Income and Expenditure Survey 2005, BBS.

[3] This, however, should not appear as a surprise since the actual pattern of food consumption is unlikely to be the same as the recommended pattern due to many factors. It is well known that the actual food consumption especially of the poorer groups is highly biased toward cereals and falls short of the minimum levels of protein and other essential nutrient intakes due to higher relative prices and other factors.

There also exists variation in per capita rice consumption among households differentiated in terms of economic status (Table 3). In rural areas, per capita rice consumption consistently rises with economic status; compared with the poor households, the consumption of rich households is 22 percent higher while the same is 10 percent higher for middle income households. In urban areas, the consumption levels have much less dispersion. The per capita consumption of rice of rich households is 5 percent lower than the poor households; while the level of consumption is 3 percent higher for the middle income households relative to the poor households.

Table 3: Per capita consumption of rice by economic status

Population group	Consumption in kg per month	
	Rural	Urban
Poor	13.48	11.77
Middle income	14.84	12.1
Rich	16.47	11.17
All	14.52	11.82

Source: HIES 2005

Note: The population groups are defined in terms of monthly household expenditure. The poor group has expenditure of less than Tk. 4,000; middle income group has expenditure less than Tk. 12,500, while the remaining households are rich.

Box 1: Average per capita per day food intake (gram)

Food Items	HIES 2005			HIES 2000		
	Total	Rural	Urban	Total	Rural	Urban
Cereals	469.2	485.6	419.3	486.7	502.8	422.4
(Rice)	(439.6)	(459.7)	(378.5)	(458.5)	(478.8)	(377.7)
Pulses	14.2	12.7	18.6	15.6	15.0	19.0
Vegetables	157.0	156.5	158.7	140.5	141.1	137.9
Potato	63.3	61.9	67.5	55.0	54.7	58.4
Fish	42.1	39.7	49.6	38.5	37.8	40.9
Meat,poultry,egg	20.8	17.6	30.7	18.5	15.4	31.0
Edible oils	16.5	14.3	22.9	12.8	11.3	19.1
Milk/milk products	32.4	31.0	36.6	29.7	29.0	32.6
Fruits	32.5	32.4	32.9	28.4	26.5	35.6
Cond. & spices	53.4	50.2	63.1	50.0	48.5	56.1
Sugar/gur	8.1	7.5	9.7	6.9	6.4	8.8
Misc.	38.2	36.9	42.5	10.0	10.2	8.9
Protein	62.5	61.7	64.9	62.5	61.9	65.0
Calorie(k. cal/capita/day)	2238.5	2253.2	2193.8	2240.3	2263.2	2150.0

Source: HIES 2005, BBS

The table shows that the average per capita per day intake of cereals and pulses has declined while, for all other major food groups, the average quantity has increased between 2000 and 2005. Moreover, the average calorie intake has also declined marginally over the period, led by decline in the rural areas.

The HIES data also indicate widening rural-urban disparity in per capita total expenditure over the years. This shows that, despite lower per capita total expenditure in rural areas, significantly higher

cereal (rice) consumption in rural areas is due to other important factors, besides income, working in opposite direction. The price of rice is usually lower in rural areas than in urban areas; and over the years, the rural-urban difference in rice price has somewhat narrowed down. In addition to income (expenditure) and price differentials, it may be important to examine several other factors that could help explain the higher per capita rice consumption in rural areas, such as prices of non-rice food and non-food items of consumption, differences in tastes and preferences, implications on energy requirements of the rural people (resulting from heavy manual work), practice of wage payment in kind (e.g. cooked food) to wage labor in rural areas, poor status of rural health and environment resulting in low efficiency of conversion of food into energy, and impact of rural infrastructure development and changes in farm technology. These and related issues need detailed study in order to draw credible conclusions regarding the current rice consumption levels in both rural and urban areas and likely future changes to help design appropriate policies.

The declining trend in per capita consumption of rice, especially in rural areas, raises obvious question with regard to the nutritional status of the poor.[4] This has important implications since rice is a cheaper source of energy relative to other food items. Available information does not help us to explain such behavior; and an appropriate study could unravel the underlying dynamics. There could be other factors that constrain the consumption of rice among the poor, such as high cost of other necessities including fuel and lighting, transport and medical services, and other basic goods and services. Moreover, since expenditure and price elasticities of demand for rice are higher for the poor, if there had been a significant rise in their income and rice prices were lower, per capita rice consumption among the poor could have been higher.

The HIES data also suggest that the saturation point with respect to consumption of rice, especially in the rural areas, has not been reached as yet. This is evident from the consistently rising consumption of rice across higher income classes in rural areas. It is important therefore for demand projections of rice to take into account these possibilities as well as the rural-urban differential in per capita consumption of rice. In addition, there exists inequality in the intra household food distribution; especially women and girl children have less access of food than men and boys, which have implications for food demand at the household level and for improving household food security. So, it is more likely that Bangladesh would experience a rising total demand for rice on account of both increased household demand (especially as income rises) and population growth. In addition, there are a few other factors that could have significant implications on the demand for food grains at any point in time.

Composition of cereal consumption: role of relative prices

One important issue that probably has significant implications on the composition of cereal consumption (e.g. rice and wheat) and consequently on the demand for rice and/or wheat is the changes in relative prices of the two cereal products.

In the recent period, prices of rice and wheat increased sharply resulting in changes in their relative prices. Table 4 gives the changes in wholesale prices of rice and wheat in the domestic market between December 2006 and December 2007.[5] The data show that the price of wheat rose at a faster rate than the price of rice, thereby turning the relative price against wheat and substitution of

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[4] The average per capita per day calorie intake has been showing declining trends in both urban and rural areas: in rural areas, it has declined from 2,267 k. cal in 1991/92 to 2,253 k. cal in 2005 while the decline has been from 2,258 k.cal in 1991/92 to 2,194 k. cal in 2005 in urban areas.
[5] Since domestic production of wheat is small and most of the country's wheat consumption is met from imports, the sharp increase in wheat price in the international market raised domestic price as well. The price of rice also increased in the international market, especially since the second half of 2007, but the impact on prices in the domestic market was not as sharp as in the case of wheat due to low import dependency in the case of rice.

consumption away from wheat and to rice.[6] The retail prices of rice and wheat also moved in the same direction; with percentage margin varying between 5 percent and 10 percent for rice and between 4 percent and 13 percent for wheat in 2007. Obviously, the issue needs further study to see the implications of price changes on demand for food grains, especially on the consumption of rice. This shows that it is important to take into account relative price changes and substitution possibilities between rice and wheat in projecting the demand for individual food grain products, especially rice.

Table 4: Percentage Changes in wholesale prices of rice and wheat

(percent)

Period	Rice		Wheat	
	Nominal	Real	Nominal	Real
Dec 2006 to Dec 2007	37.8	23.4	56.8	40.5
Jan 2006 to Dec 2006	3.2	-2.9	26.8	19.3
Jan 2007 to Dec 2007	33.1	18.9	51.5	35.3

Note: Real price=(nominal price/national CPI of the corresponding month)*national CPI of the latest month. The percentage changes are calculated on point-to-point basis.

Source: *Bangladesh Food Situation Report,* October-December, 2007, FPMU.

1.2 Stock of food grains

In preparing the food budget, FPMU considers public food grains stock only, without any accounting for private stock presumably due to lack of data. The public stock, however, is relatively low at less than 1 million metric tons.[7]

In practice, private stock of food grains, especially of rice, plays an important role in smoothing food grains consumption throughout the year. The production of *boro* rice, for instance, accounts for nearly 55 percent of total production of rice in the country; while the share of *aman* is around 40 percent and the rest 5 percent is contributed by *aus* rice. Also, the marketed share of rice during the *boro* season is higher than that during the other two seasons.

Unfortunately, we do not have reliable and adequate information on the stock of rice held by different private agents who participate in the rice market and the underlying factors that govern their stock holding behavior.[8] It is likely that the total volume of private stock of rice is large and this has important implications on total market availability of rice at any point in time and the resulting price in the market. Evidence from India suggests that private trade normally holds sizeable stock of food

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[6] The HIES 2005 figures show declining trend in wheat consumption in both rural and urban areas compared with earlier years and it is likely that these declining trends have gathered momentum in recent times (especially due to turning of relative prices against wheat) with consequent increase in consumption of rice. One recent estimate puts the cross elasticity of rice demand to wheat price at 0.33, which implies a 0.33 percent increase in the demand for rice due to 1 percent increase in the price of wheat in the domestic market. Moreover, different consumption groups are likely to show different substitution possibilities with varying implications on aggregate demand and other related variables.

[7] The public stock of food grains was 0.7 million metric tons during end-June 2006, which declined further to 0.6 million metric tons in end-June 2007. The national food policy 2006 maintains that the public stock of food grains should be kept at a level between 0.8 million metric tons to 1.0 million metric tons in order to meet uncertainty of import arrivals and emergencies, but for the last few years the public stock remained consistently lower than the required amount. For FY08, the government has decided to procure 2.3 million metric tons of food grains to ensure food security and facilitate the expanded operation of food safety net programs. It would be worthwhile to estimate the optimum stock of food grains that should be held to ensure food security under the present situation.

[8] Published statistics refer only to the stock of rice (and wheat) held by the government, mainly for distribution under different public distribution programs.

grains, and these stocks show significant year-to-year fluctuation in response to changes in output and prices.[9] It is important therefore to collect credible information on stock behavior of private traders and other participants in the food grains market since it is likely that a sizeable portion of the marketed rice is held by the private trade especially when market prices are imperfectly aligned with supply and demand forces.

Moreover, when there exist expectations of rising prices for a staple food like rice, it is likely that most consumers, having financial capability to hold stocks, would purchase rice in a bulk to maintain a reasonable amount of household stock to ensure food security at the household level. Although the amount involved in keeping such stocks may not be large at the household level, the total could be significant across all such households. It is thus important to collect information on stock behavior at the household level as well.

1.3 Estimate of total population

In estimating total consumption requirements of food grains under the FPMU methodology, the estimate of total population during the year is an important parameter. The estimates of mid-year population used by FPMU in recent years are given in Table 5. The practice of FPMU is to use the population estimates provided by BBS.

Table 5: Estimates of mid year population

FY	Mid-year population (million)
2004/05	139.76
2005/06	141.80
2006/07	143.91
2007/08	145.93

Source: Food Budget, FPMU

Alternative population projections, given in Table 6, show that FPMU uses a projected population which is based on the assumption that the replacement level fertility (NRR=1) will be achieved by the year 2011.

Table 6: Alternative projections of population in Bangladesh

(million)

Year	Constant fertility*	NRR=1 by 2021	NRR=1 by 2016	NRR=1 by 2011
2001	130.02	130.02	130.02	130.02
2002	132.60	132.60	132.60	132.60
2003	135.12	135.12	135.12	135.12
2004	137.54	137.54	137.54	137.54
2005	139.90	139.84	139.82	139.76
2006	142.21	142.04	141.97	141.80
2007	144.75	144.41	144.26	143.91
2008	147.34	146.76	146.52	145.93
2009	150.00	149.12	148.75	147.86
2010	152.73	151.48	150.96	149.69
2011	155.53	153.84	153.13	151.41

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[9] Over the five years ending 1996, procurement by private trade in India accounted, on an average, for 47 percent of market arrivals of rice and 37 percent of wheat. The annual shares fluctuated between 40 percent and 58 percent for rice and between 21 percent and 59 percent for wheat. See, *India, Foodgrains Marketing Policies: Reforming to Meet Food Security Needs,* Vol II, Report No. 1829-IN, World Bank, 1999.

The change in TFR since 1999 does not indicate that the replacement level fertility would be achieved by 2011 and, to that extent, the population estimate used by FPMU is biased downward. The country's population pyramid shows that 80 percent of the population belongs to the age group 0-39 year with 50 percent in the 0-19 year age group, pointing to the in built momentum of population increase in the near future. While an official projection of population should be adopted based on prudent assumptions, probably it may be more realistic to use population projections on the assumption that NRR=1 would be reached by 2016.[10]

The demand for food also varies with the age structure and other characteristics of the population. Normally, people in the age group 0-19 year and in the work force (15-59 year) needs more adequate diet for proper mental and physical development and retain the required level of energy. As indicated earlier, with a high share of population belonging to these age groups, the impact of age structure on food demand needs a careful study.

2. Estimates of Food Supply

The supply of food grains comes from two sources: domestic production and imports. Food grains are imported in the public sector as well as by private importers. In addition, Bangladesh receives food aid from bilateral and multilateral donors primarily for distribution under various targeted programs.

> Net production = (1-SDSFW) x gross production
>
> Total availability= net production + imports + food aid

where SDSFW is the share of deduction for seed, feed and wastage.[11]

2.1 Domestic production

Domestic production is the major source of food grains supply in the country and about 90 percent of available food grains is domestically produced. The gross production of rice (aus, aman, and boro) and wheat during the year is taken by FPMU as the starting point in calculating availability of food grains. The estimates of gross production are, however, subject to significant biases; and it is important to devise reliable method of reconciling alternative estimates (e.g. provided by BBS and Ministry of Agriculture) preferably at the upazila level.[12] In this regard, joint assessments based on a single methodology can be adopted using available capacities and skills.
Net production is calculated by deducting a certain percentage (Taken as 12 percent for FY08 and 10 percent for other years) from gross production on account of seed, feed, and wastages. The calculation of net production margin, however, needs further scrutiny since, in addition to traditional use as seed, feed and wastages, rapidly increasing amounts of rice, wheat, and other cereals are being diverted

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[10] The draft 'National Strategy for Accelerated Poverty Reduction: 2009-2011' prepared by the Planning Commission maintains that Bangladesh could achieve the replacement level fertility by 2015 at the earliest.

[11] This is usually taken as 10 percent of gross production (12 percent was taken for FY08).

[12] The gross food grains production figures are arrived at by BBS using its field offices throughout the country and by the Ministry of Agriculture with the assistance of agricultural extension officers at the field level. The production figures are finalized through joint meetings of the Ministries of Agriculture and Food and BBS. The process, however, is time consuming, inefficient, and subject to biases; and it is important to put in place a more scientific method of calculating total production figures for food grains.

toward preparation of different processed food products and in confectionaries. It is important to take this into consideration while estimating the amount of food grains available for meeting household consumption.

2.2 Imports

In recent years, imports as a proportion of gross domestic production has been around 5 percent for rice; but it is nearly three times of domestic production in the case of wheat. Imports as a percent of total availability has also varied significantly over the years (Table 8).

Table 8: Import as a % of availability

Year	Rice	Wheat	Rice and wheat
2001/02	0.54	37.37	5.10
2002/03	6.41	46.82	9.97
2003/04	3.27	54.80	8.04
2004/05	5.30	61.37	11.09
2005/06	2.04	69.48	8.53
2006/07	2.75	69.18	9.27

Source: BBS and FPMU

2.3 Total availability of food grains

Total availability of food grains (rice and wheat) since 2000/01, as per the methodology followed by FPMU, is given in Table 9. It shows progressively increasing amount of availability of food grains in the country.

Table 9: Total availability of food grains

(lac metric tons)

Year	Rice					Wheat					Total food available
	Production	Net Production	Imports	Aid	Total rice available	Production	Net Production	Imports	Aid	Total wheat available	
2000/01	250.85	225.77	5.29	0.33	231.39	16.73	15.06	5.34	4.59	24.99	256.38
2001/02	243.00	218.70	1.18	0.09	219.97	16.06	14.45	11.62	5.02	31.09	251.06
2002/03	251.87	226.68	15.53	0.00	242.21	15.07	13.56	14.14	2.50	30.02	272.23
2003/04	261.90	235.71	7.97	0.04	243.72	12.53	11.28	17.13	2.85	31.26	274.98
2004/05	251.57	226.41	12.69	0.27	239.37	9.76	8.78	18.13	2.63	29.54	268.91
2005/06	265.30	238.77	4.98	0.34	244.09	7.35	6.62	18.70	1.60	26.92	271.01
2006/07	273.18	245.86	6.95	0.25	253.06	7.37	6.63	16.35	0.65	23.63	276.69
2007/08^T	287.01	252..57	25.50	0.65	278.72	8.40	7..39	16..50	1.52	25.41	304.13

Note: T= Target
Source: BBS and FPMU

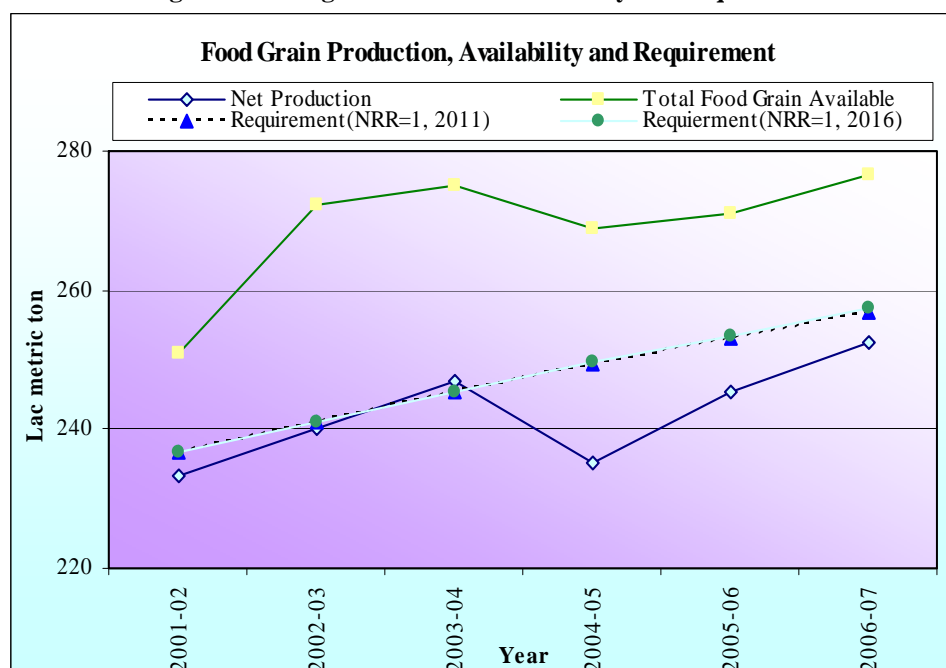## 2.4 Food grains balance: availability and requirement

The food grains balance, in terms of production, availability, and requirement aggregated over the fiscal year for some recent years is shown in Table 10 and Figure 1. It shows that, even without accounting for minor cereals (e.g. maize), the balance is positive in the sense that availability exceeds requirement for all years and the country is left with sizeable stock of food grains.

Table 10: Food grain balance: FPMU methodology

(Lac metric tons)

Year	Estimated requirement	Estimated availability	Surplus(+)/ Deficit(-)
2004/05	249.47	268.91	**+**19.44
2005/06	253.11	271.01	**+**17.90
2006/07	256.87	276.69	**+**19.82
2007/08^T	260.48	304.43	**+**43.65

Note: T= Target
Source: FPMU

Figure 1: Food grains balance: availability and requirement

Source: FPMU

This aggregate picture, however, is somewhat misleading in the sense that it masks significant variations in availability over specific periods within the fiscal year. As an illustration, we have given the food grains balance during the period of July-March for FY 07 and FY08 in Table 11. This shows the existence of significant deficits during the period in both years, which are presumably met from food grain stocks held by private traders and other market participants.

Table11: Food grains balance: July-March

(lac metric tons)

Period	Gross production (aus & aman)	Net production	Import & food aid	Total availability	Food requirement*	Surplus (+)/ Deficit (-)
2006/07	123.52	111.17	17.08	128.25	159.74	-31.49
2007/08	111.63	98.23	34.40	132.63	161.98	-29.35

* Following FPMU calculation procedure
Source: *Major Economic Indicators: Monthly Update*, April 2008, Bangladesh Bank

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3. Issues for Further Analysis

This note provides an exploratory analysis of the current methodology of setting the requirements and availability of food grains by FPMU and identifies several specific areas where efforts are needed to rationalize demand and supply estimates of food grains in Bangladesh.

Estimates of food demand

In estimating food demand, the following issues need further analysis:

- The assumed value of per capita requirement seems unrealistic, especially in view of significant differences in per capita consumption both in terms of rural-urban areas and economic status of households. Moreover, in addition to income (expenditure) and price differentials, it is important to examine several other factors that could explain higher per capita rice consumption in rural areas, such as prices of non-rice food and non-food items, differences in tastes and preferences, practice of wage payment in kind, poor status of rural health and environment, and impact of rural infrastructure development. This is needed to draw credible conclusions regarding the current rice consumption levels in both rural and urban areas and their likely future changes.

- In preparing the food grains balance sheet, FPMU considers public food grains stock only, without any accounting for private stock presumably due to lack of data. In practice, private stock of food grains, especially of rice, plays an important role in smoothing food grains consumption throughout the year. Unfortunately, we do not have reliable and adequate information on the stock of rice held by different private agents who participate in the rice market and the underlying factors that govern their stock holding behavior. The private stock has important implications on total market availability of rice at any point in time and the resulting price in the market. It is important to collect credible information on stock behavior of private traders and other participants in the food grains market.

- Moreover it is likely that most consumers having financial capability to hold stocks would purchase rice, especially when there exist expectations of rising prices for a staple food like rice, , in a bulk to maintain a reasonable amount of household stock to ensure food security at the household level. Although the amount involved in keeping such stocks may not be large at the household level, the total could be significant across all such households. It is thus important to collect information on stock behavior at the household level as well.

- One important issue that has significant implications on the composition of cereal consumption (e.g. rice and wheat) and consequently on the demand for rice and/or wheat is the changes in relative prices of the two cereal products. The issue needs further study to see the implications of price changes on demand for food grains, especially on the consumption of rice.

- The total population in a year is an important parameter for estimating total consumption requirements of food grains. The FPMU uses a projected population which is based on the assumption that the replacement level fertility (NRR=1) will be achieved by the year 2011. The issue needs in-depth analysis since it appears that the estimates of population used by FPMU contain downward bias. An official projection of population should be adopted; and probably it is more realistic to use population projections on the assumption that NRR=1 would be reached by 2016. The implications of the age structure of the population should also be taken into account in estimating food demand.

Estimates of food supply

- In arriving at estimates of gross domestic production of food grains, the current process is time consuming, inefficient, and subject to biases; and so it is important to adopt a more scientific method of calculating total production.[13]

- In calculating net production, the margin to be deducted needs scrutiny since, in addition to traditional factors, such as seed, feed, and wastages; the availability of food grains for household consumption is influenced by many other factors, including rapidly increasing amounts of rice, wheat, and other cereals used in preparing processed products and in confectioneries thereby affecting the availability of food grains for household consumption purposes.

- The aggregate picture of food balance over the year is somewhat misleading as it is likely to mask significant variations in availability over specific periods within the fiscal year. For monitoring availability and prices, it is important to compute food balances over specific periods within a year and adopt appropriate measures.

- Institutional mechanisms are needed to generate regular information based on credible monitoring of food market situation and prices and for disseminating relevant information on likely developments to concerned stakeholders for timely action.

- In addition to coordination at the national level, efforts are needed to institutionalize more effective and joint coordination (e.g. among field units of BBS, Ministry of Agriculture, and FPMU) to generate more realistic estimates of production based on uniform and mutually agreed methodology at the sub-national levels.

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[13] The reliability of statistics of area planted and yield of food grains is questionable. It is maintained that the annual area planted under rice is overestimated by nearly 28 percent. It is alleged that the extension staff at the field level provides inflated data on both area under cultivation and yield in order to prove their efficiency and fulfill production targets set by the government.

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