

Dialogue on

Boro Procurement and Food Security Strategy
An Actionable Agenda

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Keynote Presentation by

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I. Introduction

Attaining food security is the major challenge for Bangladesh particularly at a time when global prices are high and there are restrictions on exports by major rice exporting countries. To ensure food production through increased domestic production, Bangladesh has made a special programme for higher production of Boro rice in this season. Boro is the major rice crop of Bangladesh and provides about 55 percent of total rice production. Ministry of Agriculture set a target of producing 17.5 million metric tons of clean rice from 4.5 million ha of Boro cultivating area. Available information suggests that Boro production in the current season is good.

Attaining food security at the national level depends on the availability of food from domestic production and imports from the international markets. On the other hand, food security at the household level depends not only on availability of food but also on the ability to purchase food by the household. Households with adequate income can buy food from the market if it is available but low income households face problems to buy food when food prices are high. For such low income group, government distributes food through priced (such as OMS) and non-priced channels (VGD, VGF, Food for Works, etc.). Therefore, a major challenge of the government is to balance the interest of producers and consumers through government procurement and Public Food Distribution System (PFDS).

In view of this above mentioned situation, pertinent questions are: What should be the procurement strategy for Boro rice? What should be the strategy for food security in the coming years? Is it possible to formulate an actionable agenda to assure food security? How much budgetary support will be required to achieve such actionable agenda? This paper tries to answer some of these questions.

II. Boro Production Possibility and Procurement Strategy

II.1 Boro Production: Target and Achievement

As mentioned earlier, the Ministry of Agriculture (MoA) set a target of cultivating Boro rice in 45.00 lakh ha of land comprising of 12.50 lakh ha Hybrid rice, 31.25 lakh ha of HYV rice and 1.25 lakh ha of local Boro rice in FY2007/08. According to the Department of Agriculture Extension (DAE), total area under Boro rice in FY2006/07 was 43.67 lakh ha which was comprised of 3.98 lakh ha of hybrid rice, 38.11 lakh ha of HYV rice and 1.62 lakh

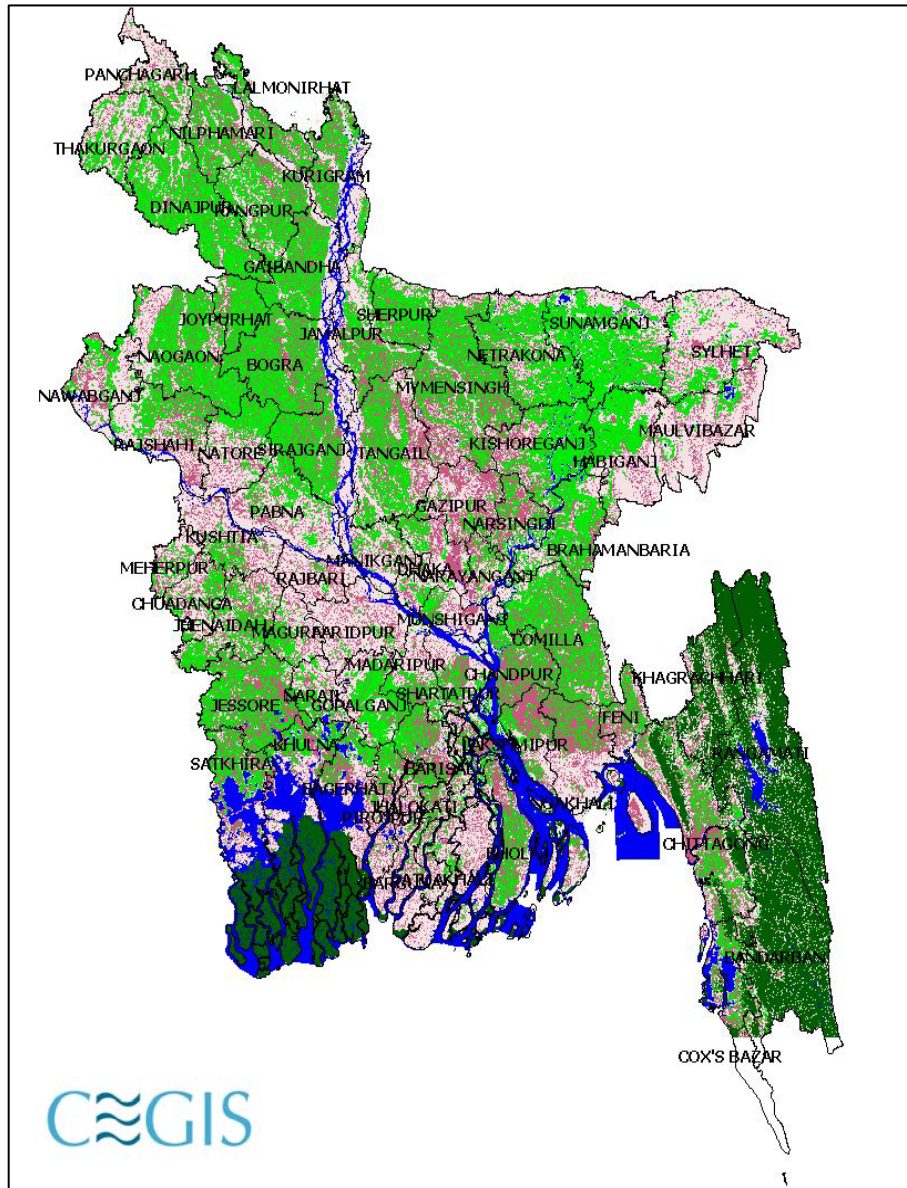
ha of local Boro rice. In other words, targeted total Boro area was 3.05 percent higher than actual Boro area in the last year (FY2006/07). In case of hybrid rice, targeted area was 217.25 percent higher than last year while it was 18.00 percent lower for HYV Boro rice. It is well known that estimates by the Bangladesh Bureau of Statistics (BBS) are different from that of the DAE. If we consider the target against actual Boro rice area estimate by the BBS, then the target was 5.68 percent higher. In terms of rice production, target for Boro rice production was set at 1.75 crore metric tons which was 16.94 percent higher than last year's actual production.

Projected Production of Boro Rice

Center for Environmental and Geographic Information Services (CEGIS), using MODIS (Moderate-Resolution Image Spectroradiometer) data of Terra satellite, has estimated area under Boro rice in the current season (to be harvested during April-June, 2008) in different districts of Bangladesh. Figure-1 shows the Terra MODIS image in false color composition, which was acquired on 07th April 2008. The ground resolution of the image is 250 meter and the bands used for the analysis by CEGIS are red, infrared and mid-infrared. According to the estimates of the CEGIS, total area under Boro rice was 4.53 million ha and Boro rice was dominantly cultivated in Sunamganj, Kishoreganj, Mymensingh, Dinajpur, Comilla, Naogaon and Bogra districts (Figure 2). Seven districts (Dinajpur, Sunamganj, Mymensingh, Noagaon, Bogra, Comilla, Netrakona) had about 32 percent of the total Boro rice area in this season and each of them had an area which is more than 1.5 lakh ha (Table 1). Another eight districts (Kishoreganj, Jessore, Rangpur, Tangail, Sirajganj, Gaibandha, Habiganj, Brahmanbaria) had a share of about 22 percent of total Boro rice area of the country and each of those districts had area between 1 lakh ha and 1.5 lakh ha area cultivated under Boro rice.

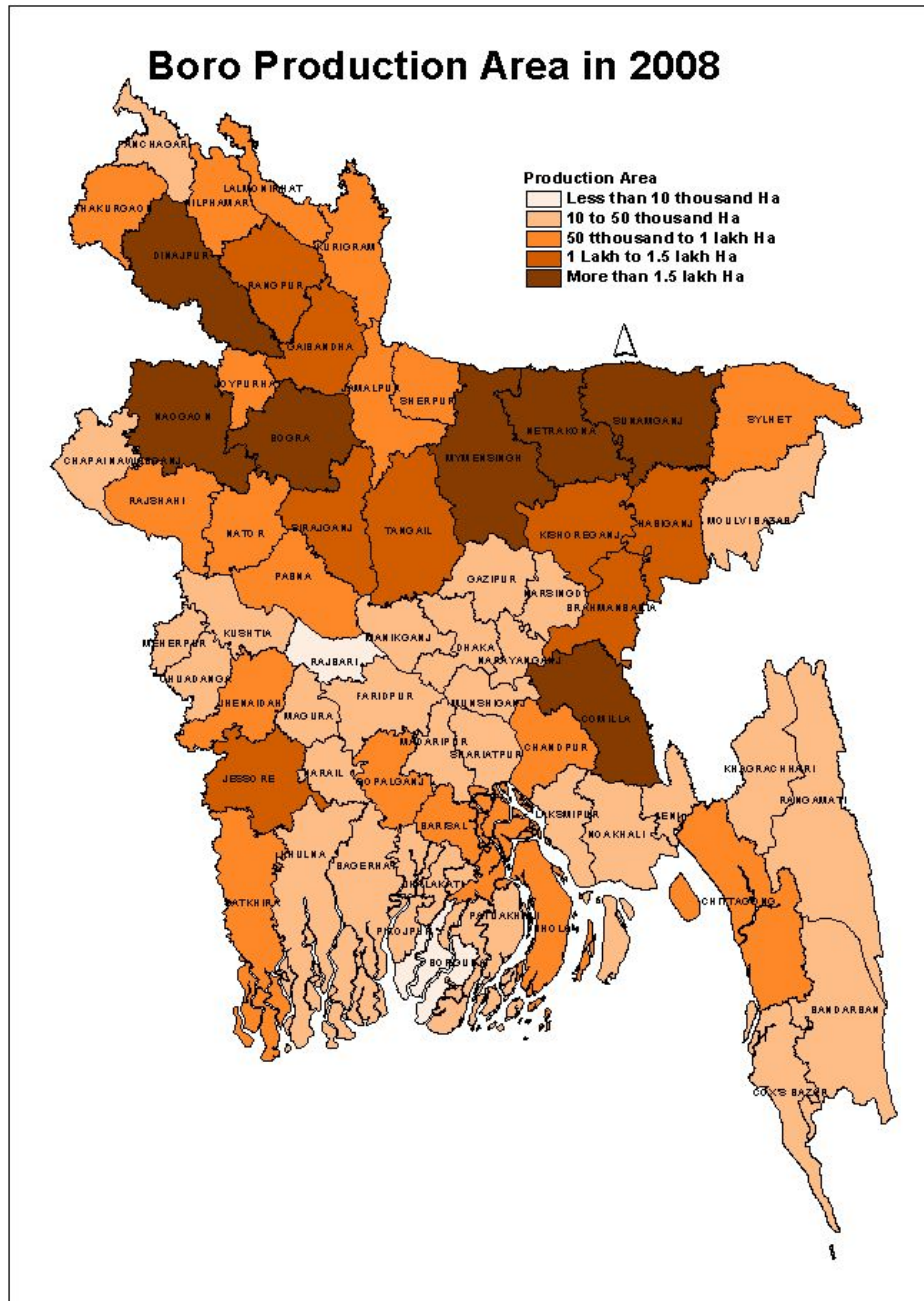
Increased area under Boro rice was due to reduction in area under Jute and Maize production in some areas and also due to cultivation in shrimp farms and some areas in the coastal region, where Boro rice were not grown in other years.

Figure 1: Spatial Distribution of Boro Rice in 2008



Source: Center for Environmental and Geographic Information Services (CEGIS)

Figure 2: Distribution of Boro Rice Area 2008



Data Source: Center for Environmental and Geographic Information Services (CEGIS) ; map prepared by CPD

Table 1: Boro Cultivated Area as Percentage of Targeted Area.

Name of the Districts	Total Targeted Area (Ha)	Achieved Area (Ha)	Achieved Area as % of Targeted Area	Name of the Districts	Total Targeted Area (Ha)	Achieved Area (Ha)	Achieved Area as % of Targeted Area
Bagerhat	34800	31931	91.76	Madaripur	46500	36950	79.46
Bandarban	5300	13463	254.02	Magura	36000	29906	83.07
Barguna	315	9525	3023.81	Manikganj	54910	24906	45.36
Barisal	64000	72844	113.82	Meherpur	22000	18081	82.19
Bhola	50985	56138	110.11	Moulavi Bazar	42000	32013	76.22
Bogra	191000	185456	97.10	Munshiganj	23381	15481	66.21
Brahmanbaria	106900	103519	96.84	Mymensingh	209500	211675	101.04
Chandpur	69500	71025	102.19	Narail	34300	30363	88.52
Chittagong	70500	83119	117.90	Narayanganj	34065	17563	51.56
Chuadanga	34200	32600	95.32	Narsingdi	57464	39919	69.47
Comilla	160180	183588	114.61	Natore	66000	65344	99.01
Cox's Bazar	41300	28413	68.80	Nawabganj	46000	41431	90.07
Dhaka	52558	36969	70.34	Netrokona	140500	178744	127.22
Dinajpur	163000	239400	146.87	Nilphamari	77450	83981	108.43
Faridpur	34200	10569	30.90	Noagaon	180100	203888	113.21
Feni	30500	31100	101.97	Noakhali	51700	46488	89.92
Gaibandha	108200	116244	107.43	Pabna	65000	59638	91.75
Gazipur	60545	24594	40.62	Panchagar	43100	28775	66.76
Gopalganj	75500	79756	105.64	Patuakhali	5140	16244	316.03
Hobiganj	99000	108225	109.32	Pirojpur	16600	26663	160.62
Jamalpur	110000	86819	78.93	Rajbari	20400	5544	27.18
Jessore	154150	148288	96.20	Rajshahi	76570	73056	95.41
Jhalokhati	9100	19169	210.65	Rangamati	7300	12031	164.81
Jhinaidah	78005	79769	102.26	Rangpur	120005	130894	109.07
Joypurhat	68000	68963	101.42	Satkhira	57000	60225	105.66
Khagrachari	10900	10731	98.45	Shariatpur	37000	26288	71.05
Khulna	39000	42131	108.03	Sherpur	76000	86275	113.52
Kishoreganj	159500	148394	93.04	Sirajganj	130500	117406	89.97
Kurigram	88600	78019	88.06	Sunamganj	172000	229319	133.33
Kustia	31800	27538	86.60	Sylhet	49000	62113	126.76
Laksmipur	26600	36825	138.44	Tangail	165577	130775	78.98
Lalmonirhat	51600	59694	115.69	Thakurgaon	57200	63744	111.44
				BANGLADESH	4500000	4530541	100.68

Source: Estimated Boro area data was obtained from the Center for Environmental and Geographic Information System (CEGIS) and data on Targeted Boro area was obtained from the Department of Agriculture Extension (DAE).

Department of Agricultural Extension (DAE) has also estimated area under Boro rice (Table 2). According to the DAE, total area under Boro rice in the current Boro season is 46 lakh and 75 thousand ha. Out of which 35 lakh 39 thousand ha is under HYV, 10 lakh 10 thousands ha under hybrid and 126 thousands ha under local varieties.

Table 2. Target and Achieved area in Boro season: as per DAE estimate.

Boro Rice	Target Area ('000 ha)	Achieved Area ('000 ha)	Achieved area as % of target
Local	125	126	100.8
Hybrid	1250	1010	80.8
HYV	3125	3539	113.2
Total	4500	4675	103.9

Source: Department of Agriculture Extension.

We have made an attempt to know the distribution of different Boro cultivars. For this, we talked to some of the major hybrid seed selling companies (Supreme, Aftab, BRAC), discussed with experts, agriculture reporters and visited in some of the Boro rice growing areas. In addition, we have analyzed distribution of Boro rice cultivars in other years. Based on our analysis, observations and consultations, we think that distribution of different types of Boro cultivars may be as in Table 3. Local varieties had an approximately 3 percent of total Boro rice area of the current Boro season. Important local varieties cultivated are Kali Boro, Jagli and Binni. Popular HYV rice varieties were BR28, BR29. These two varieties covered approximately 60 percent of area under HYV. BR 14 (Gazi) has grown in about 4 percent of total HYV area. Rest of the area under HYV is covered by other varieties. Among the Hybrids, most popular variety was *Heera* (32% of all hybrids), followed by BRAC hybrids (Aloran, Jagoron and Shakti covering 22% of all hybrids), Sonar Bangla (9% of all hybrids), hybrids marketed by ACI (9% of all hybrids), Aftab (7% of all hybrids), Lal Teer (marketed by East-West Seed Company: 7% of all hybrids) and others (14%).

Table 3. Distribution of Different Types of Boro rice

Type of Boro Rice	% of Boro rice area
Local variety	3
Hybrid rice	12
HYV rice	85

Source: Author's estimate.

About one-fourth of the total Boro rice area was under electricity operated irrigation and the rest were under diesel operated irrigation system (an insignificant acreage was under traditional and gravity channel irrigation system).

Production environment was very favorable in terms of physical and climatic consideration. So far good rains occurred four times. Boro cultivation also faced some problems. These included disease infestation by Bacterial Leaf Streak (BLS) and Bacterial Leaf Blight (BLB) in Nertrokona, Khulna, Jessore, Magura, Jhenidah and Bagerhat. Affected rice fields may experience 5 to 10 percent reduction in yield due to BLB and BLS but this may not affect the national average yield level.

Yield of Boro Rice

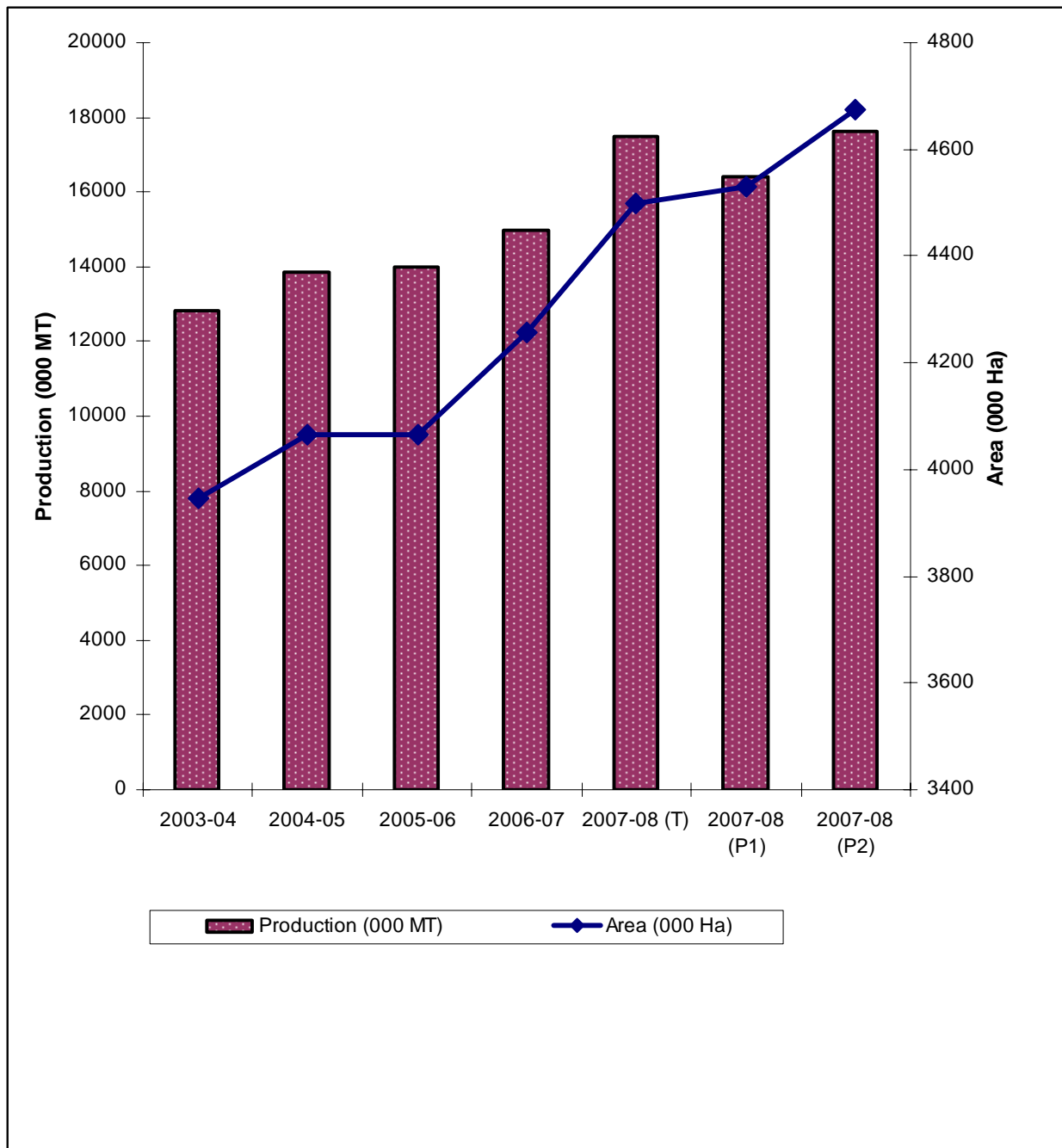
Considering the production environment and crop situation, we think that likely average yield of different types of rice in terms of paddy may be as follows:

- HYV Boro paddy: 2.3 tons per acre.
- Hybrid Boro paddy: 2.7 tons per acre.
- Local Boro paddy: 0.8 tons per acre.

Projected Production in Boro Season

Considering the above yield level for different types of Boro rice, it is possible to project the total production of Boro rice for this season. On the basis of total area estimated by the CEGIS (i.e. 45.31 lakh ha), Boro production is likely to be about 1 crore and 64 lakh metric tons of clean rice (Figure 3). On the other hand, total production might be 1 crore and 76 lakh metric tons of clean rice if we consider total area estimates (46.75 lakh ha) of the Department of Agriculture.

Figure 3: Projected Boro Production in FY2007/08 (to be harvested in April-June 2008)



Source: Author's estimate.

II.2 Cost of Production of Boro Rice During the April-June 2008 Harvesting Season

Estimated cost of production of Boro rice during the current Boro season is provided in Table 4.

Production Cost Per Acre

- Per acre production cost of diesel irrigated HYV Boro rice: Tk 30,392
- Per acre production cost of electricity operated HYV Boro rice: Tk 27,242.
- Per acre production cost of diesel irrigated Hybrid Boro rice: Tk 33,241
- Per acre production cost of electricity operated Hybrid Boro rice: Tk 30,091.

Production Cost Per Kg

- Per Kg production cost of HYV Boro paddy: Tk 13.21 for diesel irrigated production and Tk 11.84 for electricity irrigated production.
- Per Kg production cost of Hybrid Boro paddy: Tk 12.31 for diesel irrigated production and Tk 11.14 for electricity irrigated production.
- Per Kg production cost of HYV Boro rice: Tk 20.93 for diesel irrigated production and Tk 18.86 for electricity irrigated production.
- Per Kg production cost of Hybrid Boro rice: Tk 19.56 for diesel irrigated production and Tk 17.80 for electricity irrigated production.
- Weighted average cost of production of Boro paddy: Tk 12.77/ kg and Boro rice: Tk 20.26/kg.

Table 4: Per Acre Production Cost of Boro Rice in Bangladesh during the April-June 2008 Harvesting Season

	Input use	Unit	HYV Boro Rice (2007/08)				Hybrid Rice (2007/08)			
			Unit price (Tk)	Quantity per acre	Diesel Irrigated (TK)	Electricity driven (TK)	Unit price (Tk)	Quantity per acre	Diesel Irrigated (Tk)	Electricity driven (Tk)
1	Seed	Kg	30.00	25	750.00	750.00	200.00	6	1200.00	1200.00
2	Fertilizer	Kg								
2.1	Urea		7.00	100	700.00	700.00	7.00	110	770.00	770.00
2.2	TSP		40.00	36	1440.00	1440.00	40.00	40	1600.00	1600.00
2.3	MP		35.00	31	1085.00	1085.00	35.00	40	1400.00	1400.00
2.4	Gypsum (S)		6.00	22	132.00	132.00	6.00	25	150.00	150.00
2.5	Zinc									
2.6	Manure		1.75	200	350.00	350.00	1.75	200	350.00	350.00
3	Pesticide	Tk			500.00	500.00			1000.00	1000.00
4	Human labour	Man-days	150.00	75	11250.00	11250.00	150.00	85	12750.00	12750.00
5	Land cultivation (bullock/PT)	Tk			2500.00	2500.00			2200.00	2200.00
6	Irrigation	Tk			5000.00	2000.00			5000.00	2000.00
7	Interest on operating capital	Tk			1185.35	1035.35			1321.00	1171.00
8	Land rent				5500.00	5500.00			5500.00	5500.00
9	Per acre total production cost				30392.35	27242.35			33241.00	30091.00
10	Paddy Production per acre	Kg		2300				2700		
11	Per kg production cost: Paddy				13.21	11.84			12.31	11.14
12	Rice (clean) production per acre				1518.00	1518.00			1782.00	1782.00
13	Milling cost (including parboiling)	Kg	0.60		1380.00	1380.00	0.60		1620.00	1620.00
14	Per kg production cost: Rice				20.93	18.86			19.56	17.80

Weighted average cost of production of Boro paddy: Tk 12.77/ kg and Boro rice: Tk 20.26/kg.

Source: Author's estimation

II.3 Procurement Strategy

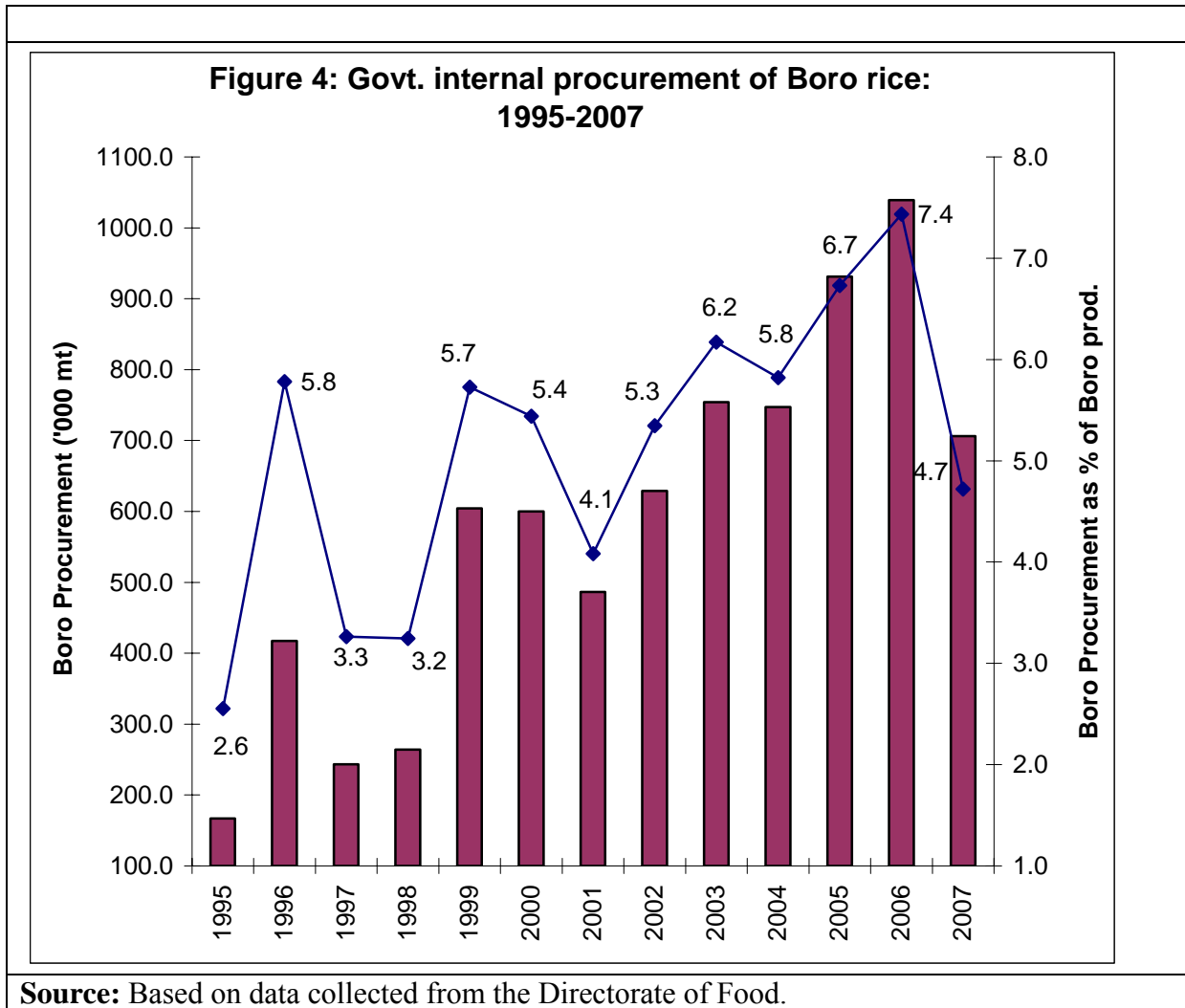
Government needs to design its Boro procurement programme considering the following issues: (1) Cost of Boro production, (2) Adequate incentives for the Boro rice growers, (3) market price at the time of fixation of price, (4) Consumers interest as regards affordable price for rice and (5) Increased public stock of rice.

On 15 April 2008, the government has announced that it will procure 12 to 15 lakh metric tons of rice and paddy from the domestic market. To achieve this, government has fixed the procurement price for Boro rice at Tk 28 per kg and that of boro paddy at Tk 18 a kg. According to the announcement, procurement would start from 16 April 2008. Pertinent questions are: Is it a realistic target? Has the procurement price set by the government been able to make a balance between the interest of the producers and consumers? Does the government has capacity to procure this amount of rice and paddy?

Trends in procurement of Boro rice during the last 12 years (1995-2007) is shown in Figure 4. It is evident from the figure that total Boro rice procured (in terms of rice equivalent) in 2005, 2006 and 2007 were 9.31 lakh metric tons, 10.39 lakh metric tons and 7.06 lakh metric tons, respectively. In terms of Boro rice procured as percent of total Boro production was 6.7 percent, 7.4 percent and 4.7 percent in 2005, 2006 and 2007, respectively. This year's target (12 to 15 lakh metric tons) is likely to be 7.3 to 9.1 percent of projected production of Boro rice; even if we consider the lower level of production possibility. Therefore, target for Boro procurement seems to be realistic.

Considering the average cost of production of Boro paddy (Tk 12.77 per kg) and Boro rice (Tk 20.26/kg), procurement price of Boro paddy (Tk 18.00 per kg) and Boro rice (Tk 28.00 per kg) is a reasonable balance between the interest of producers and consumers. However, the government may need to review the price after monitoring the actual level of procurement.

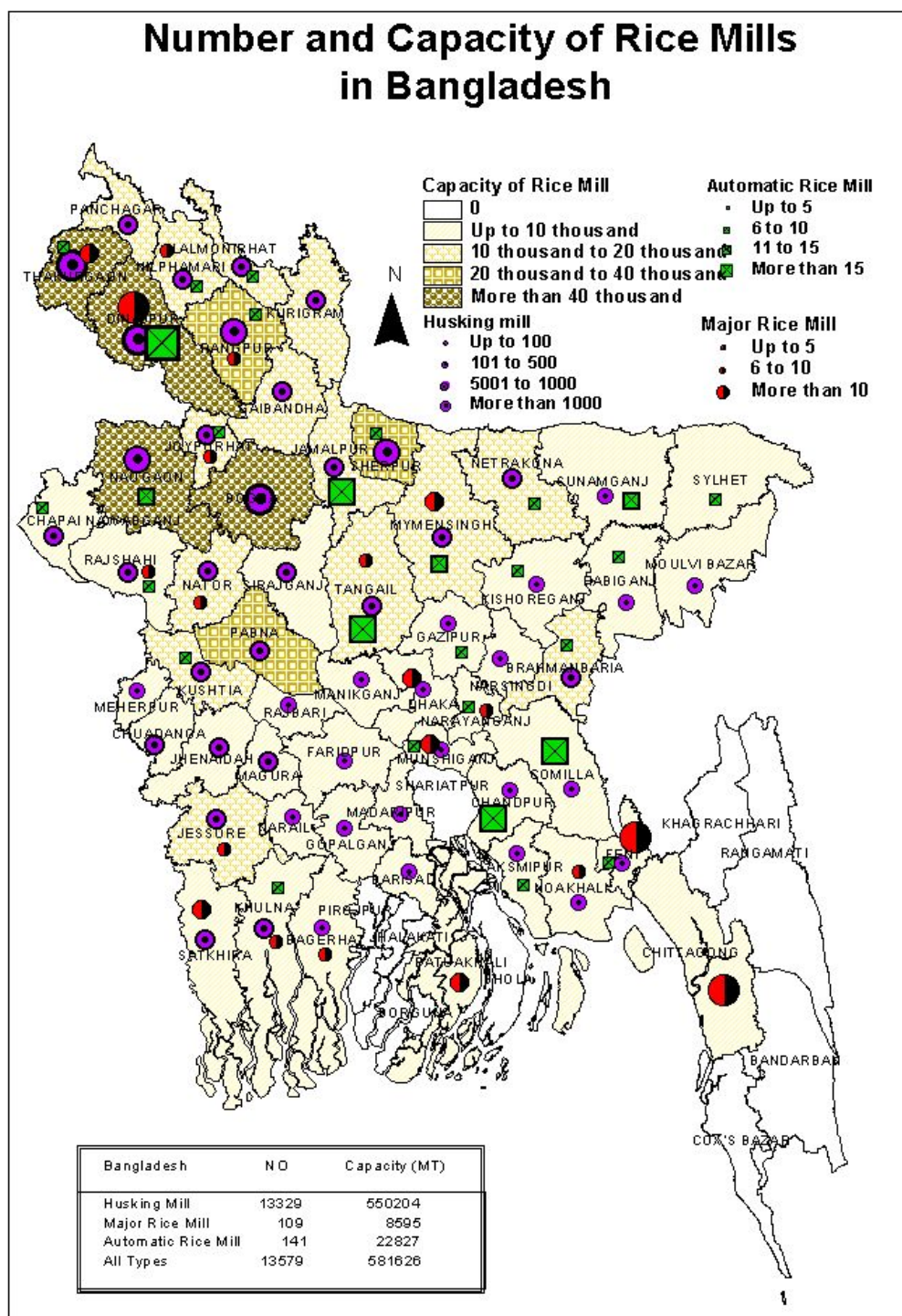
To achieve the targets of Boro rice procurement which areas should get priority? During the last Boro season (in 2007), the government procured Rice and Boro paddy equivalent to 706 thousand metric tons of clean rice from 42 districts. About 53 percent of the procured Boro rice was from six districts (Dinajpur, Bogra, Thakurgaon, Naogaon, Rangpur and Joypurhat) while about 27 percent of the total Boro rice procurement was from 8 districts (Kurigram, Gaibandha, Sherpur, Natore, Pabna, Mymensingh, Jamalpur and Netrokona). These districts may also be the major source of Boro procurement this year.



Procurement strategy needs to consider the rice milling capacity and also the storage capacity of the government. Figure 5 shows the number and capacity of rice mills in Bangladesh. Total number of rice mills in Bangladesh is 13,579 with a total capacity of 5.8 lakh metric tons. Among the rice mills, 98 percent are husking mills. Number of “Major Rice Mills” is 109 and number of automatic rice mills are 141. Husking mills are more concentrated in Dinajpur, Bogra and Thakurgaon districts.

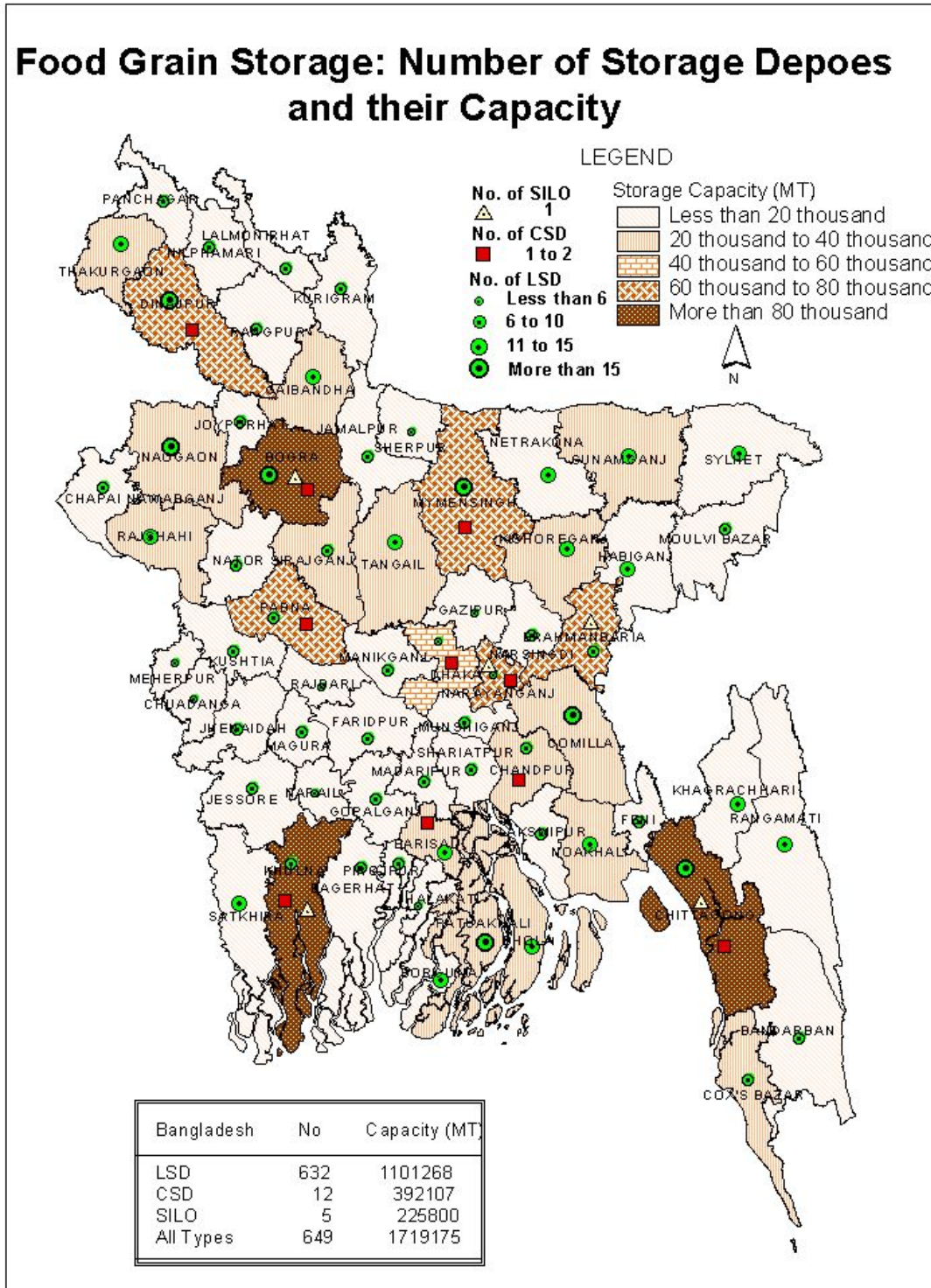
In case of grain storage facility, the government has 649 storage facilities with a total capacity of 17 lakh metric tons for rice and wheat (Figure 6). Out of these, 632 LSD have the capacity to store 11 lakh metric tons while rests of the storage facilities are in CSD and Silo. About 28 percent of the total storage capacity of LSD is in eight districts (Dinajpur, Bogra, Mymensingh, Naogaon, Patuakhali, Chittagong, Comilla and Sylhet).

Figure 5. Number and Capacity of Rice Mills in Bangladesh.



Source: Prepared by CPD, based on data collected from Directorate of Food.

Figure 6. Food Grain Storage Capacity in Bangladesh



Source: Prepared by CPD, based on data collected from the Directorate of Food.

III. Achieving Food Security in FY2008-09 and Beyond

III.1 Trends in Prices of Rice

An analysis of domestic prices (both for wholesale and retail) of coarse and medium rice (Figure 7 to Figure 9) revealed that price of rice has increased exponentially during the last one year. It is also revealed that domestic price of rice has increased sharply with the announcement of minimum export price by India. It was true for both the retail and wholesale market. It may be recalled that India first announced minimum export price of non-basmati rice as US\$ 425 per metric ton on 25 October 2007. Subsequently, India announced US\$ 505 per metric ton on 27 December 2007 and US\$ 650 per metric ton on 19 March 2008. Finally, India announced minimum export price US\$ 1000 per metric ton on 28 March 2008.

At the international level probably minimum export price announced by the government of India also had an effect (Figure 10).

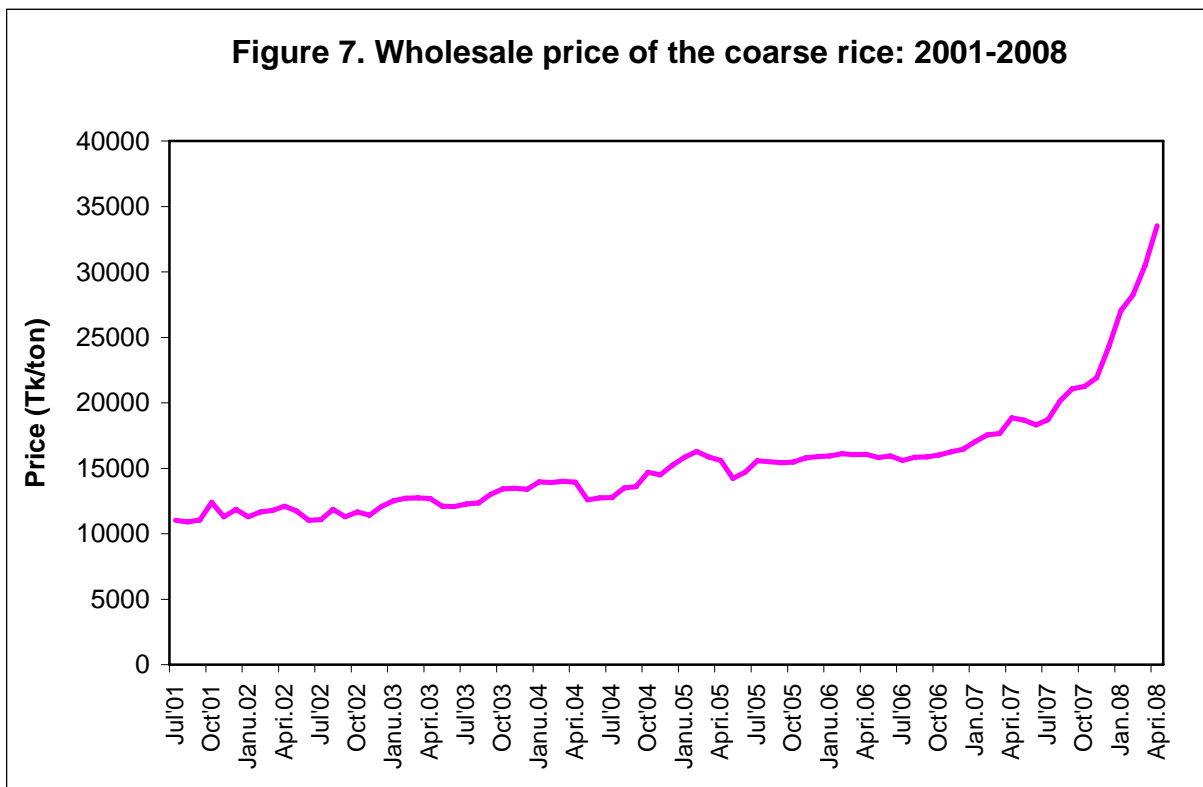


Figure 8. Retail and Wholesale Price of the Coarse Rice (BR 8, BR 11, Swarna): Jan 2007-April 2008

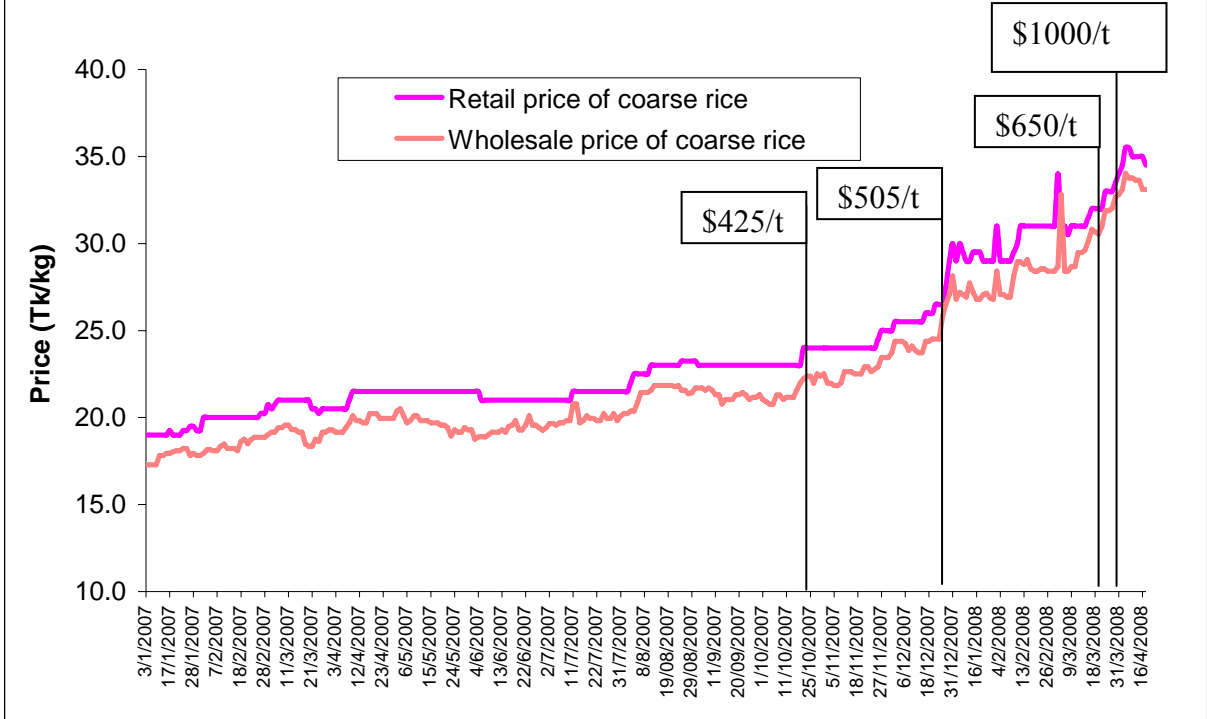
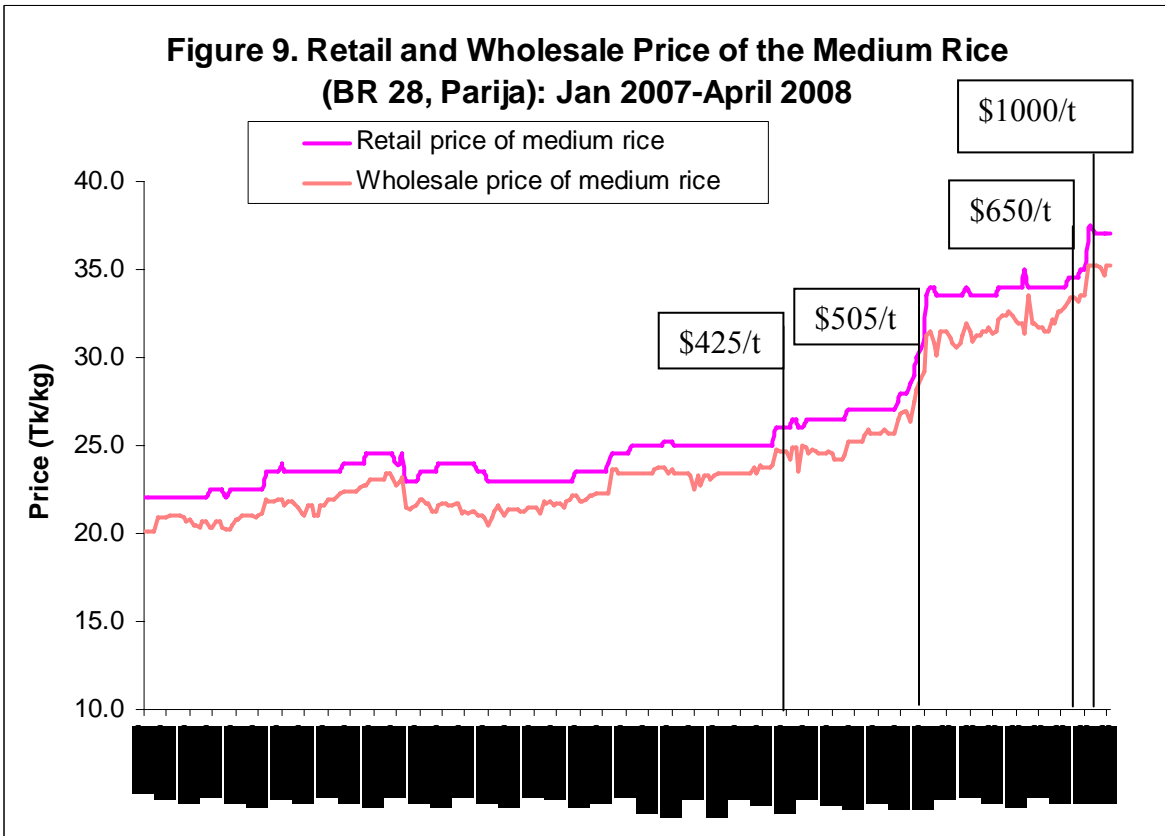
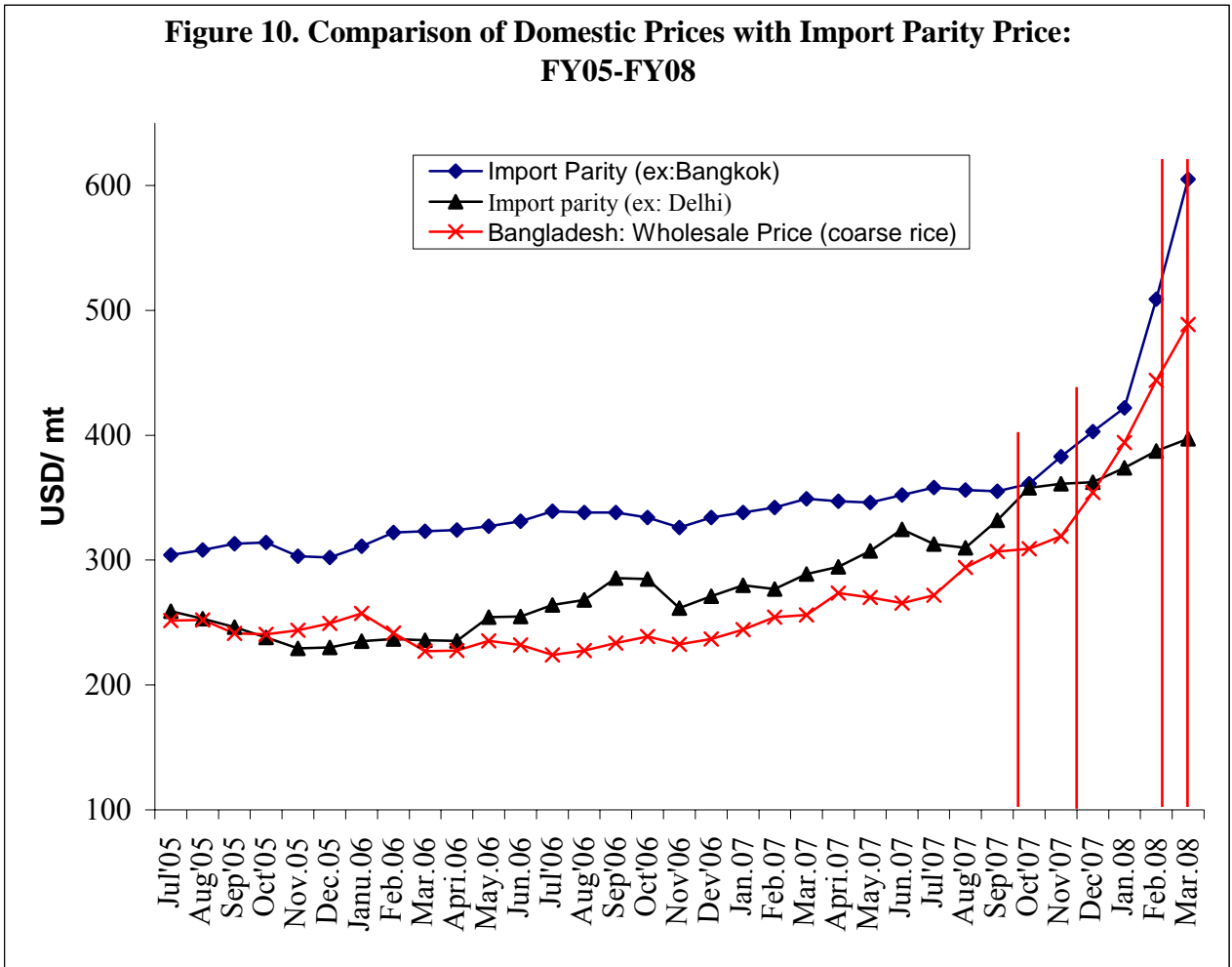


Figure 9. Retail and Wholesale Price of the Medium Rice (BR 28, Parija): Jan 2007-April 2008





Considering the hurdles of rice import in FY2007/08 as well as export bans by major rice exporting countries Bangladesh must depend on its own production to meet up its foodgrain requirement. A national target of producing at least 32 million tons of rice needs to be set for FY2008/09 and all efforts of all stakeholders must be geared to attain this *comfort zone of food security*. To this end, a strategy is suggested for the upcoming Aman and Boro season.

III.2 Production Strategy for Aman and Boro

For increased production in the upcoming Aman and Boro season, Bangladesh must have to promote improved varieties, supply adequate amount of fertilizers, ensure availability as well as affordability of diesel for irrigation and ensure supply of electricity for irrigation. With proper support for tillage and irrigation, additional 10 lakh ha of coastal areas may be brought under cultivation during the Boro season. It is also possible to increase area under Aman rice particularly in the coastal belt. Aman season has the advantage of low or almost no cost for irrigation. Therefore, adequate importance for increase in production in the Aman season would be required.

Seed

Hossain et al (2002) has shown that rice production may be increased by 20 lakhs only by providing quality seeds of existing varieties cultivated by farmers.

We have compiled list of recent cultivars suitable for production in different districts during Aman and Boro season. Compiled list is provided in Table 5 and Table 6. Figure 11 and 12 portray the recently released suitable improved varieties for cultivation in Aman and Boro season. In addition, hybrids which are currently approved for cultivation during the Boro season are listed in Table 7. It is also known that some hybrids with short duration may be released for cultivation which provides yield advantage compared to short duration HYVs such as BR33. Expedient release of such varieties would provide some opportunity for increased cropping intensity through scope of cultivating mustard and other short duration crops after Aman and before Boro rice.

During the Aman season, BR 11 is still the most popular variety but it has degenerated at the farmer's level. Therefore, distribution of quality seed of BR 11 will increase production. Efforts should be made to promote BRRRI Dhan 40 and BRRRI Dhan 41 in salt affected coastal regions. For late cultivation, BRRRI Dhan 46, BRRRI Dhan 37, BRRRI Dhan 38 and Binashail Dhan need to be promoted. BRRRI Dhan 44 has the scope to be cultivated in major areas of the Coastal belt. In Monga affected regions BRRRI Dhan 33 need to be promoted. During the Boro season, BRRRI Dhan 47 may be promoted in the salinity affected Coastal region. Distribution of quality seeds of BRRRI Dhan 28 and BRRRI Dhan 29 would be beneficial.

Table 5: HYVs suitable for cultivation in the Aman season.

Aman Variety	Districts
BR 22 (Kiron)	Bagerhat, Barguna, Barisal, Bhola, Chandpur, Chittagong, Cox's bazar, Feni, Jhalakathi, Khulna, Laksmipur, Noakhali, Patuakhali, Pirojpur, Satkhira,
BR 23 (Dishari)	Bagerhat, Barguna, Barisal, Bhola, Chandpur, Chittagong, Cox's bazar, Feni, Jhalakathi, Khulna, Laksmipur, Noakhali, Patuakhali, Pirojpur, Satkhira,
BRRI Dhan 30	Banderban, Brahmanbaria, Chandpur, Chittagong, Comilla, Gazipur, Habiganj, Jamalpur, Jessore, Khagrachari, Kishoreganj, Laksmipur, Magura, Moulvibazar, Mymensingh, Narail, Narshindhi, Netrokona, Rajbari, Rangamati, Sherpur, Sirajganj, Sylhet, Tangail,
BRRI Dhan 31	Banderban, Barguna, Barisal, Bhola, Bogra, Brahmanbaria, Chandpur, Chittagong, Chuadanga, Comilla, Cox's bazar, Dhaka, Dinajpur, Faridpur, Feni, Gaibandha, Gazipur, Gopalganj, Habiganj, Jamalpur, Jessore, Jhalakathi, Jhenidah, Joypurhat, Khagrachari, Kishoreganj, Kurigram, Kushtia, Laksmipur, Lalmonirhat, Madaripur, Magura, Manikganj, Meherpur, Moulvibazar, Munshiganj, Mymensingh, Narail, Narayanganj, Narshindhi, Natore, Nawabganj, Netrokona, Nilphamari, Naogaon, Noakhali, Pabna, Panchagarh, Pirojpur, Rajbari, Rajshahi, Rangamati, Rangpur, Sariapur, Sherpur, Sirajganj, Sylhet, Tangail, Thakurgaon
BRRI Dhan 32	Banderban, Barguna, Barisal, Bogra, Brahmanbaria, Chandpur, Chittagong, Chuadanga, Comilla, Cox's bazar, Dhaka, Dinajpur, Faridpur, Feni, Gaibandha, Gazipur, Gopalganj, Jamalpur, Jessore, Jhalakathi, Jhenidah, Joypurhat, Khagrachari, Kishoreganj, Kurigram, Kushtia, Laksmipur, Lalmonirhat, Madaripur, Manikganj, Meherpur, Moulvibazar, Munshiganj, Mymensingh, Narail, Narayanganj, Narshindhi, Natore, Nawabganj, Netrokona, Nilphamari, Naogaon, Noakhali, Pabna, Panchagarh, Patuakhali, Pirojpur, Rajbari, Rajshahi, Rangamati, Rangpur, Sariapur, Sherpur, Sirajganj, Sylhet, Tangail, Thakurgaon
BRRI Dhan 33	Bogra, Chuadanga, Comilla, Dinajpur, Habiganj, Jamalpur, Jessore, Kurigram, Kushtia, Lalmonirhat, Madaripur, Meherpur, Mymensingh, Natore, Nilphamari, Naogaon, Noakhali, Panchagarh, Rajshahi, Rangpur, Sherpur, Thakurgaon
BRRI Dhan 34	Barisal, Bhola, Bogra, Chittagong, Comilla, Cox's bazar, Dinajpur, Gazipur, Jessore, Joypurhat, Khulna, Mymensingh, Nawabganj, Netrokona, Naogaon, Rajshahi, Sylhet, Thakurgaon
BRRI Dhan 37	Bagerhat, Barguna, Barisal, Bhola, Chandpur, Chittagong, Cox's bazar, Feni, Jhalakathi, Khulna, Laksmipur, Noakhali, Patuakhali, Pirojpur, Satkhira,
BRRI Dhan 38	Bagerhat, Barguna, Barisal, Bhola, Chandpur, Chittagong, Cox's bazar, Feni, Jhalakathi, Khulna, Laksmipur, Noakhali, Patuakhali, Pirojpur, Satkhira,
BRRI Dhan 40	Bagerhat, Barguna, Barisal, Bhola, Chandpur, Chittagong, Cox's bazar, Jhalakathi, Khulna, Laksmipur, Noakhali, Patuakhali, Pirojpur, Satkhira
BRRI Dhan 41	Bagerhat, Barguna, Barisal, Bhola, Chittagong, Cox's bazar, Jhalakathi, Khulna, Laksmipur, Noakhali, Patuakhali, Pirojpur, Satkhira,
BRRI Dhan 46	Bagerhat, Barguna, Barisal, Bhola, Chittagong, Cox's bazar, Feni, Jhalakathi, Khulna, Laksmipur, Noakhali, Patuakhali, Pirojpur, Satkhira,
Binashail	Bagerhat, Barguna, Barisal, Bhola, Chandpur, Chittagong, Cox's bazar, Feni, Jhalakathi, Khulna, Laksmipur, Noakhali, Patuakhali, Pirojpur, Satkhira,

Source: Compiled from Adhunik Dhaner Chash and Krishi Diary 2008.

Table 6: HYVs suitable for cultivation in the Boro season.

Boro Variety	Districts
BRR1 Dhan 28	Bagerhat, Banderban, Barguna, Barisal, Bhola, Bogra, Brahmanbaria, Chandpur, Chittagong, Chuadanga, Comilla, Cox's bazar, Dhaka, Dinajpur, Faridpur, Feni, Gaibandha, Gazipur, Gopalganj, Habiganj, Jamalpur, Jessore, Jhalakathi, Jhenidah, Joypurhat, Khagrachari, Khulna, Kishoreganj, Kurigram, Kushtia, Laksmipur, Lalmonirhat, Madaripur, Magura, Manikganj, Meherpur, Moulvibazar, Munshiganj, Mymensingh, Narail, Narayanganj, Narshingdi, Natore, Nawabganj, Netrokona, Nilphamari, Naogaon, Noakhali, Pabna, Panchagarh, Patuakhali, Pirojpur, Rajbari, Rajshahi, Rangamati, Rangpur, Satkhira, Sariatpur, Sherpur, Sirajganj, Sylhet, Tangail, Thakurgaon
BRR1 Dhan 29	Bagerhat, Banderban, Barguna, Barisal, Bhola, Brahmanbaria, Chandpur, Chittagong, Comilla, Cox's bazar, Dhaka, Faridpur, Feni, Gaibandha, Gazipur, Habiganj, Jamalpur, Jessore, Jhalakathi, Joypurhat, Khagrachari, Khulna, Kishoreganj, Laksmipur, Lalmonirhat, Madaripur, Manikganj, Moulvibazar, Mymensingh, Narayanganj, Narshingdi, Natore, Nawabganj, Netrokona, Nilphamari, Noakhali, Pabna, Patuakhali, Pirojpur, Rajbari, Rajshahi, Rangamati, Rangpur, Satkhira, Sariatpur, Sherpur, Sirajganj, Sylhet, Tangail,
BRR1 Dhan 35	Bagerhat, Barguna, Barisal, Bhola, Brahmanbaria, Chandpur, Chittagong, Chuadanga, Comilla, Cox's bazar, Dhaka, Gazipur, Gopalganj, Habiganj, Jamalpur, Jessore, Jhalakathi, Jhenidah, Khulna, Kishoreganj, Madaripur, Manikganj, Meherpur, Moulvibazar, Mymensingh, Narail, Natore, Netrokona, Noakhali, Patuakhali, Pirojpur, Rajshahi, Satkhira, Sherpur, Sirajganj, Sylhet, Tangail,
BRR1 Dhan 36	Bogra, Chittagong, Chuadanga, Comilla, Dinajpur, Gaibandha, Gazipur, Habiganj, Joypurhat, Kurigram, Kushtia, Lalmonirhat, Manikganj, Moulvibazar, Mymensingh, Natore, Nawabganj, Nilphamari, Naogaon, Pabna, Panchagarh, Rajshahi, Rangpur, Sirajganj, Sirajganj, Sylhet, Tangail, Thakurgaon
BRR1 Dhan 47	Bagerhat, Barguna, Barisal, Bhola, Chittagong, Cox's bazar, Jhalakathi, Khulna, Laksmipur, Noakhali, Patuakhali, Pirojpur, Satkhira,

Source: Compiled from Adhunik Dhaner Chash and Krishi Diary 2008.

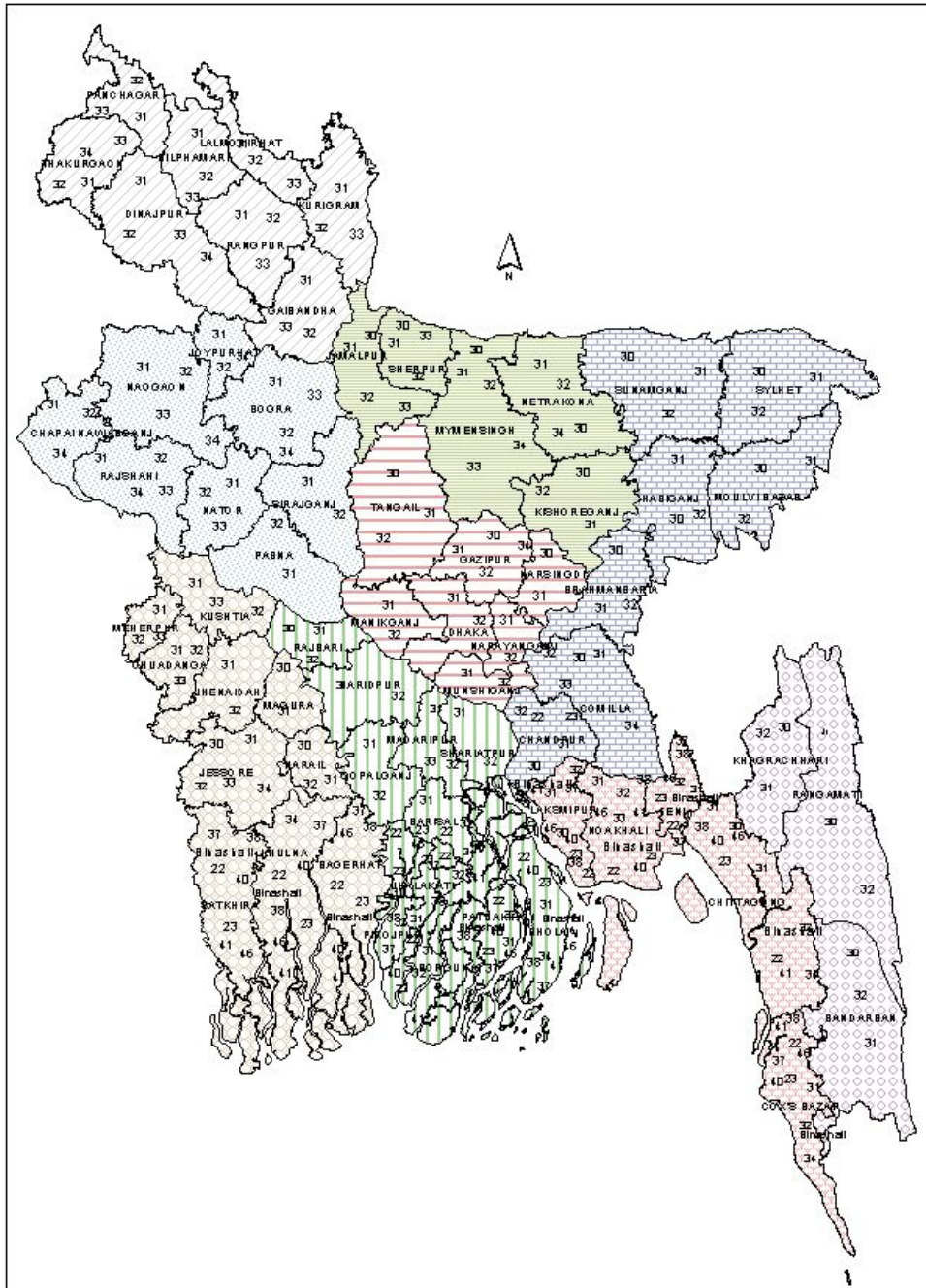
Table 7: Rice hybrids registered for cultivation by National Seed Board from 1998 to 2006-07.

Name of the hybrid	Name of the company	Year of release	Released for cultivation in the following area
AALOK-6201	ACI Limited	1998	All areas
Loknath-505	Macdonald	1998	All areas
Amarsri-1	Ganges D.Co.	1998	All areas
CNSGC-6	Mollika seed co	1998	All areas
IAHS-100001	Aftab Multipurpose Farm Ltd	2000	All areas
IR69690	BRR1	2001	Jessore, Barisal
ZF-31	Aftab Multipurpose Farm Ltd	2001	Dhaka, Rajshahi, Rangpur
ZF-37	Aftab Multipurpose Farm Ltd	2001	Mymensingh, Jessore
Hybrid Rice No.99-5	Supreme Seed Company Ltd	2001, 2003	Mymensingh, Jessore, Comilla, Rajshahi, Rangpur
RICER-101	Chense Crop Science Bangladesh Limited	2005	All areas
GB-4(Jagoron)	BRAC	2003	All areas
LP-50	Aftab Multipurpose Farm Ltd	2002, 2004, 2005	Mymensingh, Jessore, comilla, Rajshahi, Rangpur
HS-273	Supreme Seed Company	2003, 2005	Comilla, Rajshahi, Dhaka, Mymensingh
AALOK93024	ACI Limited	2003	Comilla, Rajshahi

Name of the hybrid	Name of the company	Year of release	Released for cultivation in the following area
HB-8	BRAC	2005	All areas
TINPATA-40	Tinpata Quality Seed Bangladesh Ltd	2005,2006	Dhaka, Mymensing, Comilla, Jessore, Rajshahi
TAJ-1(GRA-2)	National Seed Company Ltd	2006	,Mymensingh, Comilla, Rangpur
TAJ-2 (GRA-3)	National Seed Company Ltd	2006	Mymensingh, Comilla
HTM-4(Sunar Bangla-6)	Mollika Seed Co.	2006	Dhaka, Mymensingh, Comilla, Jessore
HTM-606	North South Seed Ltd	2006	Mymensingh, Comilla
HTM-707	North South Seed Ltd	2006	Mymensingh, Comilla
HTM-202	East West Seed Bangladesh Limited	2006	Mymensingh, Comilla
HTM-303	East West Seed Bangladesh Limited	2006	,Dhaka,Mymensingh, Comilla,Rajshahi
LP-108	Sea Trade Fertilizer Limited	2006	Mymensingh, Comilla,Rajshahi
LU You-2(Surma-1)	Sinzenta Bangladesh Limited	2006	Dhaka, Mymensingh, Comilla
LU You-3(Surma-2)	Sinzenta Bangladesh Limited	2006	Mymensingh, Comilla,Jessore,Rajshahi
TINPATA-10	Tinpata Quality Seed Bangladesh Ltd	2006	Mymensingh, Comilla,Rajshahi
TINPATA SUPER	Tinpata Quality Seed Bangladesh Ltd	2006	Mymensingh, Comilla
LP-70	Aftab Multipurpose Farm Ltd	2006	Mymensingh, Comilla,Jessore
ACI-1	ACI Ltd	2006	Mymensingh, Comilla,Jessore
ACI-2	ACI Ltd	2006	Mymensingh, Comilla,Jessore,Rajshahi
BW001(Jagoron-3)	BRAC	2006	Mymensingh, Comilla,Jessore
S-2B(Krishan-2)		2006	Mymensingh, Comilla, Rajshahi
HRM-01(Agrani-7)		2006	Mymensingh, Comilla
HRM-02(Sarothi-14)		2006	Mymensingh, Comilla
Rupasi Bangla-1		2006	Mymensingh, Comilla
HB-9(Aloron-2)		2006	Mymensingh, Comilla, Rajshahi
Supreme Hybrid - 5(Hira-5)		2006	Mymensingh, Comilla
WBR-2(Modhumati-2)		2006	Mymensingh, Comilla
WBR-5(Modhumati-5)		2006	Mymensingh, Comilla,Jessore

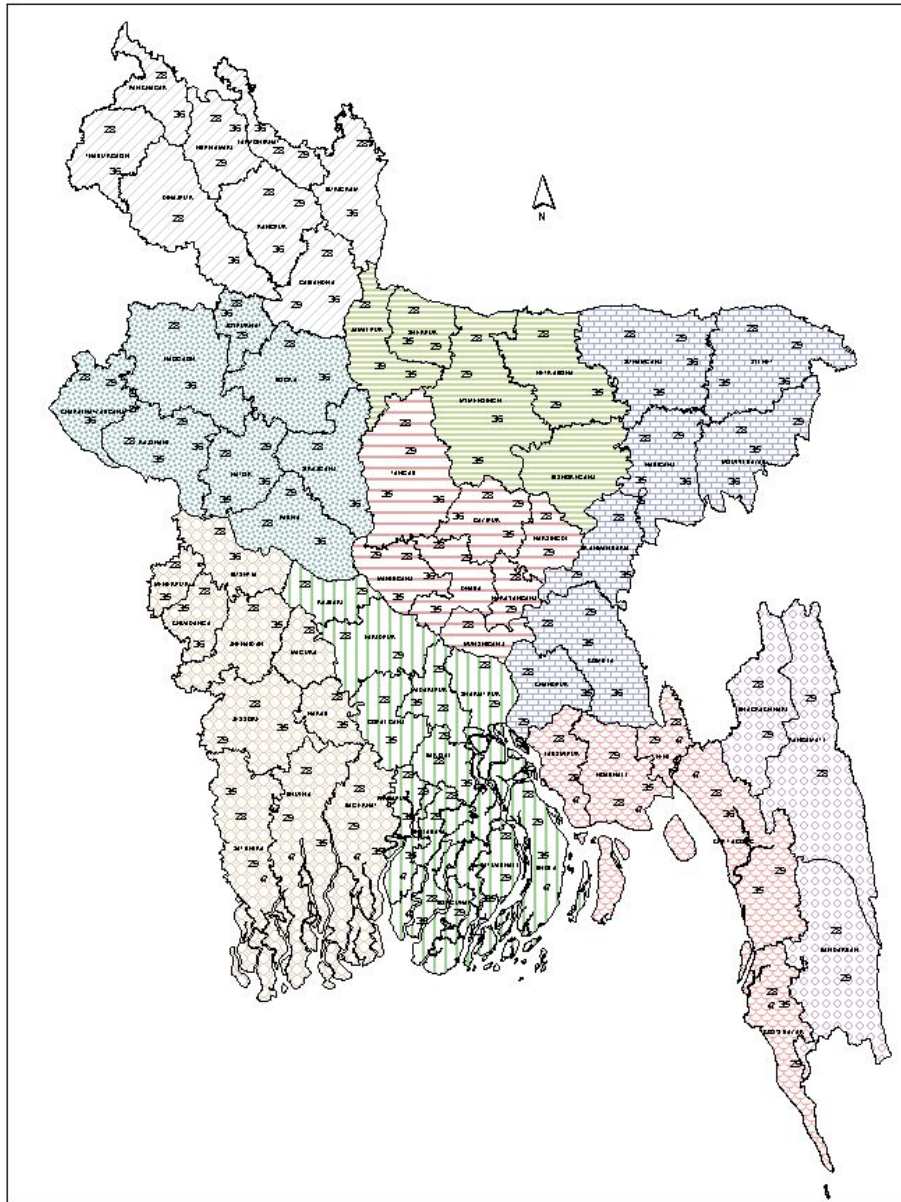
Source: National Seed Board, Bangladesh.

Figure 11: HYVs suitable for cultivation in Aman Season



Source: Compiled from *Adhunik Dhaner Chash* and *Krishi Diary* 2008

Figure 12: HYVs suitable for Cultivation in Boro Season



Source: Compiled from Adhunik Dhaner Chash and Krishi Diary 2008.

Fertilizer

Supply of adequate level of fertilizer is essential to ensure production. Trends in fertilizer supply during the last five years are reported in Table 8.

Table 8: Supply of Fertilizer in Bangladesh

(in lakh metric ton)

	2004-05	2005-06	2006-2007	2007-08 (Demand)
Urea	25.23	24.61	25.27	28.18
TSP	4.2	4.36	3.4	4.76
DAP	1.71	1.3	1.15	2.5
MoP	2.6	2.91	2.3	4
Total	33.74	33.18	32.12	39.44

Source: Weekly fertilizer report, 2008, Ministry of Agriculture

A recent report by Dr Z Karim (Karim 2008) has observed that supply of fertilizer was able to cater the need of medium yield goals. The report added that for achieving high yield goals, fertilizer requirement needs an upward revision. According to the report fertilizer requirement in 2007/08 was 35.2 metric tons of Urea, 5.9 metric tons of TSP, 5.0 metric tons of MoP and 3.2 metric tons of DAP (Table 9).

Table 9. Demand-Supply Situation in Bangladesh: 2007/08

(in Lakh metric tons)

Types of Fertilizer	Demand as per govt.	Estimate of actual demand	Gaps
Urea	28.14	35.2	7.0
TSP	4.75	5.9	1.2
MoP	4.0	5.0	1.0
DAP	2.5	3.2	0.7

Source: Karim, Z,(2008) 'Current Farm Level Fertilizer Situation and Agricultural Productivity in Bangladesh' ; Table 5.

In view of the above situation, it is pertinent to report here the level of recommended fertilizers for achieving different levels of yield goals in various crops (Table 10). Considering high prices of agricultural commodities and need for increased production, a pragmatic plan should aim for high yield goals. High yield goals may be possible in some fertile soils (suppose one third of the total is under the crop). With these assumptions in mind, we have estimated likely demand for fertilizer in FY2008/09 and estimated demand is reported in Table 11. According to our estimates, total demand for Urea fertilizer would be 34.79 lakh metric tons, for TSP 8.71 lakh metric tons, and for MoP 14.30 lakh metric tons. Thus, estimates reconfirm that provision of different fertilizer as estimate by Dr. Z. Karim for

FY 2007/08 may also remain valid for FY 2008/09. Therefore, the government may plan to provide 35.2 lakh metric tons of Urea, 5.9 lakh metric tons of TSP, 5.0 lakh metric tons of MoP and 3.2 lakh metric tons of DAP in FY 2008/09

Table 10. Fertilizer Recommendation Dose for High Yield Goal

Crops	High Yield Goal (ton/ha)	Fertilizer recommendation dose (kg/ ha)			
		Urea	TSP	MP	Total
Aus	3.5 ± 0.35	130.2	30.0	30.0	190.2
Aman	5 ± 0.5	227.9	35.0	48.0	310.9
Boro	6.0 ± 0.6	342.9	90.0	76.0	508.9
Wheat	4.0	256.1	110.0	197.0	563.1
Maize	8.0	347.2	145.0	268.0	760.2
Potato	30.0	284.3	100.0	386.0	770.3
Onion	35.0	260.4	110.0	266.0	636.4
Lentil	1.0	123.7	32.5	36.0	192.2
Jute	3.0	212.7	100.0	400.0	712.7
Chili	1.5 ± 0.5	173.6	125.0	120.0	418.6

Source: Fertilizer recommendation guide 2005

Table 11. Estimated Demand for Fertilizer to Achieve the Actionable Production

Crops	Targeted area (lakh ha)	Fertilizer Demand for Bangladesh			
		Urea	TSP	MP	Total
Aus	11	1190.16	274.23	292.38	1756.77
Aman	58	11323.36	1933.08	2706.42	15962.87
Boro	45	13700.10	3674.25	3780.72	21155.07
Wheat	4	1024.24	440.00	788.00	2252.24
Maize	2.3	798.56	333.50	616.40	1748.46
Potato	4	1137.08	400.00	1544.00	3081.08
Onion	1.6	416.64	176.00	425.60	1018.24
Lentil	1.5	185.54	48.75	54.00	288.29
Jute	4.85	1031.40	485.00	1940.00	3456.40
Chilli	1.6	277.76	200.00	192.00	669.76
Vegetable	6.75	1708.88	742.50	1965.00	4416.38
Other uses		2000.00			2000.00
Total		34793.71	8707.31	14304.52	57805.55
Demand estimate by MoA for 2007-08		28.18	4.76	4.00	36.94

Note: Vegetable includes cabbage, cauliflower, tomato, carrot, cucumber, brinjal, pumpkin, radish and spinach.

Water Management and Crop Husbandry Practices

Efficiency of water used for irrigation is low in Bangladesh. Scientists have already proved that adoption of alternate wet and dry (AWD) irrigation technology for Boro rice cultivation can save 25 percent irrigation water and also save energy (electricity, diesel) without reducing the yield level. Therefore, special efforts should be made to promote AWD instead of current practice of constant irrigation with standing water in the field. This will reduce per unit production cost of rice.

Introduction of System of Rice Intensification (SRI) has also the potential for reduction in cost and increase in yield. Special efforts should be made to promote SRI technology.

Agricultural Research and Extension Service

Adequate support for agricultural research and extension service would be required to achieve higher production. To this end, Training and research supports for frontier rice science particularly for bio-technology and hybrid should get priority. Training of extension workers particularly for agricultural officers and assistant officers working at the Upazila and Block level are essential. Use of ICT and electronic media for dissemination of agricultural technologies should be promoted.

III.3 Designing Social Safety Net Programmes

Increased production alone would not be sufficient to ensure food security for the lower income group. During the July-March of FY2007/08, amount of food grains distributed under various PFDS channels was about 9.52 lakh metric tons. This amount might be increased in the next fiscal year (FY2008/09). Social Safety Net Programme needs to be designed in such a way so that hard core poor families can be covered.

Table 12. Foodgrains distribution under Safety Net Programmes: July-March' FY08

	PFDS Channel	July/07 to March/08		
		Qty (MT)	Families	Man Days
1	OMS (by DG Food)	134077	39838105 persons*	
2	OMS and Fair Price (by BDR)	44409	8881800 Persons	
3	FFW	100465		16744206
4	VGD	151189	750000**	
		15500	465570***	
5	TR	74994		12499000
6	GR	34859	3485900√	
7	VGf	336765	9143716****	
8	Hill Tracts	50120		8353333
9	LEI	9300	281818	
	Total	951678	62846909	37596539

Note:

- A family consists of 5 members
- * Every alternate day 3 Kg. Rice/Persons for the month of Sep-Oct/07 and Jan/08 and 4kg.Rice/Person (for Feb/08 and march/08 and 5 Kg. from April/08)
- ** Every month @ 30/25 Kg. Rice/Fortified atta
- *** Special VGD for 3 months in Sidr areas
- *** Through different programmes each family received 10 to 15 Kg. Rice per month for 01-06 months.
- √ 10 Kg. Rice (Average) per family one time

Source: Directorate of Food.

IV. Budgetary Allocations Required

The government has to ensure supply of good quality seeds, fertilizer and irrigation for increased production in the coming Aman and Boro season. A mechanism for regular market monitoring has to be put in place towards this. In this context, public and private enterprises and interested NGOs need to be provided with appropriate incentives through fiscal measures, and related supports (provision of Breeders' Seed at a subsidized rate). In view of these, following actions and provisions in the budget are proposed:

Seed Supply

- Special support may be provided for production of Breeder's seed of recently released varieties of rice. This support may be provided as an additional allocation to the agricultural research institutes to be used for production of Breeders' seed which will be distributed at a nominal price to the Bangladesh Agricultural Development Corporation (BADC) and private seed companies and NGOs for subsequent production of truthful level (TFL) seed to be used for cultivation by the farmers. Taka 50 crore may be allocated as revolving fund for this programme.
- Allocation should be made for procurement of quality seeds, particularly those of recently released varieties such as BRRI Dhan 47 suitable for cultivation in salinity prone areas during Boro season; BRRI Dhan 40 and BRRI Dhan 41 suitable for cultivation in salinity prone areas during the Aman season. This will increase the ability of the public sector to supply quality seed for rapid expansion of modern varieties.

- To promote hybrid rice seed production in the country, government needs to encourage public sector agencies such as BADC, BRRI, BINA and agricultural universities as well as private seed companies and NGOs involved in seed production and marketing.
- Continue zero tariff/low tariff for import of different kinds of seeds.

Fertilizer

- Annual demand for fertiliser for Urea, TSP and MoP in FY2008-09 need to be determined as per the production target. Government may plan to provide 35.2 lakh metric tons of Urea, 5.9 lakh metric tons of TSP, 5.0 lakh metric tons of MoP and 3.2 lakh metric tons of DAP in FY 2008/09. Amount for fertilizer subsidy should be estimated accordingly and allocated.
- To encourage balanced use of fertilizers, government may consider redistribution of subsidy among the various types of fertilizers e.g., Urea, TSP and MP.
- Duty-free import of fertilisers should continue.
- Fertiliser prices are increasing world wide and therefore, budgetary provisions are required for increased domestic production of fertilisers which may include renovation of existing fertiliser factories and establishment of new fertiliser factories.

Subsidy on Diesel and Electricity for Irrigation

- Continue 20 per cent subsidy on electricity bills of *Palli Bidut Samities (PBSs)* for electricity and waiver of minimum charge for all electricity connections throughout the country for irrigation which has been effective from 1 July 2005.
- Extend coverage of rural electrification and ensure regular supply of electricity to reduce cost of irrigation and sustain economic activities in rural areas.
- Amount, mode and time of payment for diesel subsidy need to be revisited. The budget for FY2007-08 proposed Tk 750 crore as subsidy on diesel used in irrigation which was reduced to Tk 250 crore at a later stage.
- In the Budget of FY2007-08, 10 per cent duty on import of power pumps was introduced. This may be withdrawn.

Procurement of Foodgrains

- The government will need to make adequate allocation for procurement of Boro and Aman. For procurement of 12 to 15 lakh metric tons of rice in the current season would require approximately Tk. 3000 crore to Tk 4500 crore.

Others

- A fund of Tk 100 crore has been allocated in FY2007-08 for small farmers affected by natural disasters. This should be further enhanced in view of the severe disasters of FY2007-08 and their implication on the affected farmers.
- Government needs to undertake a special programme for establishing different types of Krishi Bazars for farmers, particularly in the higher production areas of Bangladesh.
- Strengthening extension and marketing services for agricultural products is necessary through more allocation in these areas for such activities.
- Allocation for agricultural research needs to be increased.

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