

## **LONG-TERM ASSESSMENT OF RICE PRODUCTION SCENARIO IN BANGLADESH: A MACRO DYNAMICS**

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### **Abstract**

Despite high pressure of population on land and other natural resources, Bangladesh has made remarkable progress in food production over the last three and a half decades. The shrinking trend in land availability for crop production is another challenge ahead of the economy. The declining trend in cultivable land was quite sharp in the period of 1990 to 2005. Although the population has doubled, cereal food production has increased in the range of 100-125% during this period. The progress is the result of development and dissemination of modern high-yielding rice and wheat varieties supported by favourable public policies. There has been impressive technological advancement in the rice sector. Bangladesh Rice Research Institute (BRRI) made substantial contribution in the recent past and a total of 59 modern high yielding rice varieties (HYVs) suitable for different production ecologies have been released after independence in 1972. Although the progress in variety development was slower during the seventies and eighties, it was triggered up in the later decades and a quantum of achievement was made after 2000. The rate of varietal development was almost double in the last quarter of the decades compared to that made in the seventies. During the period of 1972 to 1980, the share of modern rice in total production was only 29%, but by the year 1985, it increased to 41% and jumped to nearly 90% by 2010 implying a highly impressive contribution of the diffusion of modern rice technologies in the overall supply of cereal foods in the country.

Keywords: Long-term assessment, rice production scenario, macro dynamics.

### **1. Introduction**

Bangladesh is an agro-based country with population of about 155.1 millions living in 14.84 million hectares of land. According to the estimate of World Bank, the population will have possibly increased to 230 million by the year 2030 with almost half of the people living in cities and towns (BBS, 2010). Rice is the staple dietary item for the people and per capita rice consumption is about 166 kg/year (BBS, 2010). Rice alone provides 76% of the calorie intake and 66% of total protein requirement (Bhuiyan *et al.*, 2002). It employs about 43.6% of total labor forces (BBS, 2010, HIES, 2009). Rice covers about 81% of the total cropped area (BBS, 2010). Rice alone shares about 96% of the total cereal food supply. Further more, rice alone contributes about 9.5 % of the total agricultural

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GDP in the country. Among all crops, rice is the driving force of Bangladesh agriculture. In fact, food production in Bangladesh is dominated by a single crop (rice) and a single season (boro, which accounts for over 60% of total rice production) (MoFDM, 2012)

The topographical situation along with availability of water and sub tropical climate constitutes an excellent habitat for rice cultivation in Bangladesh. In fact, there are different rice ecosystems, namely upland (direct-seeded pre-monsoon Aus), irrigated (mainly, dry-season Boro), rainfed lowland (mainly monsoon-season transplanted Aman, medium-deep stagnant water (50-100cm), (BBS, 2009).

Although rice production in Bangladesh increased more than three folds in the last few decades, the country still could not attain sustainable self sufficiency in food. Gradual decrease of cultivable land in one hand and increased population on the other coupled with degrading natural resources and competitive world market put Bangladesh into a daunting challenge.

Ensuring food security for all is one of the major challenges in Bangladesh today. At the same breath, production and availability of food grains through proper utilization of the limited land resource base in order to meeting the demand is also a great challenge for Bangladesh. Despite the impressive achievements in food grain production during the last few decades, food supply and availability both at the households and individual level remain a major concern for the government (Shakila *et al.*, 2008). Since rice is the main staple, food security in Bangladesh critically depends on its adequate availability and accessibility throughout the year (Mujeri *et. al.*, 2012). However frequent occurrence of devastating floods, droughts, cyclones etc. have caused slower agricultural growth in Bangladesh resulting disruption to the overall supply of food grains.

The available statistics indicate that Bangladesh has made considerable success in agriculture in achieving near self-sufficiency in food grain (particularly rice) production. There has been quite improvement in terms of food grain availability over the years. In fact, per capita availability of rice has increased from 140 kg in 1972 to 180 kg in 2008, despite the fact that population has increased tremendously by this period implying an overall increase in food demand. Virtually, Bangladesh still imports wheat and some rice especially at times of disaster (e.g. floods, cyclone) (Hossain *et al.*, 2009). The total food grain import in 2010-11 was about 5.31 mmt. of which 1.56 mmt was rice and 3.75 mmt wheat (MoFDM, 2012). However, assessment of long-term cereal food supply scenario in Bangladesh with respect to the pertinent indicators could be of immense use for the researchers, planners and policy makers as well; and as such the present study was undertaken.

## **Objectives**

The specific objectives of the study were as follows:

- i) to analyse the land use pattern for cereal food (rice) production and to document the changes in area devotion to rice production with respect to the technological advancement over time;
- ii) to understand the contribution of modern rice varieties towards maintaining stability in cereal food supply; and
- iii) to visualize the overall scenario in availability of cereal foods and understand the challenges ahead.

## **II. Methodology**

The present study used mainly the secondary data. As such, the required data were collected from different published and unpublished reports of Bangladesh Bureau of Statistics, Directorate of Agricultural Extension, Household Income Expenditure Survey (HIES), Bangladesh Rice Research Institute and CIMMYT Bangladesh office. The collected data were then scrutinized and processed using appropriate computer software. Mainly descriptive statistics were employed in analyzing the data. Descriptive analysis was used with the aid of tabular technique to classify the generated data and to derive meaningful findings by employing mostly the measures of central dispersion (arithmetic mean, percentage and ratios, etc.).

## **III. Results and Discussion**

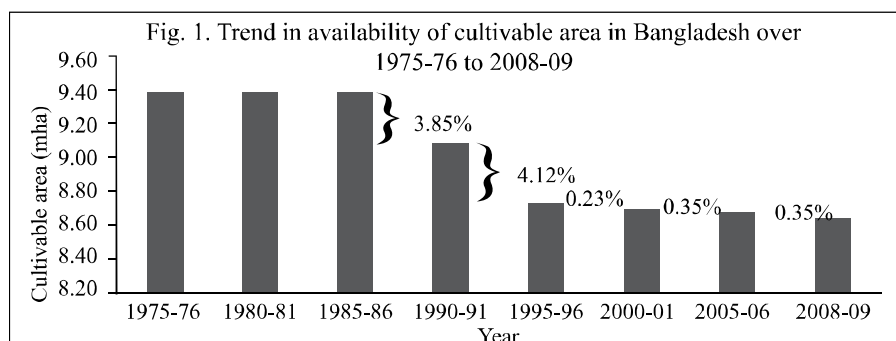
### **3.1 The scenario of land use pattern**

Land, the key natural element for crop production is considered to be the highly scarce resource in Bangladesh. The scenario of availability of the cultivable land in Bangladesh can be viewed in Table 1. The net cultivable area was about 9.38 million hectares in 1982 which has drastically declined to 8.7 million hectares by a period of only 10 years (i.e. in 1992-93). With a consistent declining trend, this area further decreased to 8.2 million hectares in 2006 implying an alarming scenario for the economy as a whole. At the same breath, the net sown area was 8.56 million hectares in 1981 which declined to 7.7 million hectares in 1993 and this remained almost stagnant upto the period of 2008-09. However, the declining ratio of the cultivable land over time has been presented in figure 1. The rate of decline in cultivable land from 1986 to 1990 was about 3.8%. Very unfortunately the ratio of decline in cultivable land was even higher for the period of 1990 to 1995 (about 4.1%). The continuation of such decline in availability of cultivable land will of course pose serious risk in terms of domestic production and supply food crops in Bangladesh.

**Table 1. Land utilization pattern in Bangladesh: 1980-2009.**

| Year    | Net cultivable land (million ha) | Total rice area (million ha) | Net area sown (million ha) | Total cropped area (million ha) | Cropping Intensity (%) |
|---------|----------------------------------|------------------------------|----------------------------|---------------------------------|------------------------|
| 1980-81 | 9.38                             | 10.30                        | 8.56                       | 13.16                           | 153.74                 |
| 1981-82 | 9.38                             | 10.45                        | 8.53                       | 13.20                           | 153.85                 |
| 1982-83 | 9.36                             | 10.58                        | 8.65                       | 13.00                           | 150.29                 |
| 1983-84 | 9.46                             | 10.55                        | 8.68                       | 13.36                           | 153.92                 |
| 1984-85 | 9.43                             | 10.22                        | 8.64                       | 13.15                           | 152.20                 |
| 1985-86 | 9.44                             | 10.40                        | 8.75                       | 13.54                           | 154.74                 |
| 1986-87 | 9.51                             | 10.61                        | 8.85                       | 13.34                           | 150.73                 |
| 1987-88 | 9.82                             | 10.32                        | 8.29                       | 13.82                           | 166.71                 |
| 1988-89 | 9.84                             | 10.22                        | 8.15                       | 13.71                           | 168.22                 |
| 1989-90 | 9.78                             | 10.41                        | 8.35                       | 14.06                           | 168.38                 |
| 1990-91 | 9.72                             | 10.43                        | 8.17                       | 14.03                           | 171.73                 |
| 1991-92 | 9.09                             | 10.24                        | 7.98                       | 13.81                           | 173.06                 |
| 1992-93 | 8.75                             | 10.18                        | 7.85                       | 13.70                           | 174.52                 |
| 1993-94 | 7.86                             | 10.07                        | 7.72                       | 13.48                           | 174.61                 |
| 1994-95 | 8.77                             | 09.92                        | 7.74                       | 13.52                           | 174.68                 |
| 1995-96 | 8.72                             | 09.94                        | 7.80                       | 13.51                           | 173.21                 |
| 1996-97 | 8.24                             | 10.18                        | 7.85                       | 13.80                           | 175.8                  |
| 1997-98 | 8.36                             | 10.26                        | 7.97                       | 14.09                           | 176.79                 |
| 1998-99 | 8.43                             | 10.12                        | 7.99                       | 13.96                           | 174.72                 |
| 1999-00 | 8.45                             | 10.71                        | 8.13                       | 14.27                           | 175.52                 |
| 2000-01 | 8.40                             | 10.80                        | 8.08                       | 14.30                           | 176.98                 |
| 2001-02 | 8.48                             | 10.66                        | 8.08                       | 14.30                           | 176.98                 |
| 2002-03 | 8.42                             | 10.77                        | 8.04                       | 14.17                           | 176.24                 |
| 2003-04 | 8.40                             | 10.82                        | 8.03                       | 14.23                           | 177.21                 |
| 2004-05 | 8.44                             | 10.37                        | 7.97                       | 14.1                            | 176.91                 |
| 2005-06 | 8.29                             | 10.53                        | 8.03                       | 14.20                           | 180.0                  |
| 2006-07 | 8.29                             | 10.58                        | 8.03                       | 14.20                           | 180.0                  |
| 2007-08 | 9.09                             | 9.98                         | 8.23                       | 16.50                           | 179.0                  |
| 2008-09 | 9.09                             | 10.81                        | 7.77                       | 13.88                           | 179.0                  |

Source: Bangladesh Bureau of Statistics (BBS); various volumes.



Source: BBS, 2010

The scenario of projected land availability in Bangladesh is shown in Table 2. It appears from the projection that both the net cultivable area and net sown area have had a declining trend over the years 1999-2010. The projection also indicated that, after 2010 towards 2020, in both the aforesaid land availability indicators will have sharper declining trend. The per capita availability of cultivable land will reach to 0.05 ha in 2020 which was about 0.064 ha in 2010. In fact, there was no notable change in total cropped area (TCA) during the recent years, except that in 2007 there was an increase in TCA which was about 5.47% higher compared to that of the previous year. Actually, this was the result of increase in cropping intensity over the period under consideration. It is important to note that, area under rice production in Bangladesh has been in a consistent level over long time. Due to the availability of improved rice technologies, the harvest area of rice increased from 10.3 million ha in 1981 to 10.8 million ha in 2009.

**Table 2. Projected land availability for crop production in Bangladesh, 1999-2020.**

| Year | Net sown area (mha) | Net cultivable area (mha) | Cropping intensity (%) | Per capita net cultivable area (ha) |
|------|---------------------|---------------------------|------------------------|-------------------------------------|
| 1999 | 7.99                | 8.42                      | 174.7                  | 0.066                               |
| 2000 | 7.96                | 8.35                      | 174.8                  | 0.066                               |
| 2005 | 7.90                | 8.28                      | 176.3                  | 0.064                               |
| 2010 | 7.81                | 8.17                      | 177.6                  | 0.060                               |
| 2015 | 7.77                | 8.05                      | 178.9                  | 0.055                               |
| 2020 | 7.71                | 7.94                      | 180.2                  | 0.052                               |

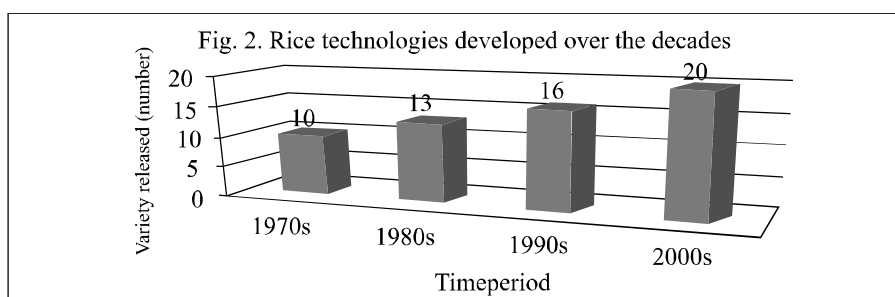
Note: The base year is 1999 for projection

Sources: Ministry of Agriculture, GOB, (2004) and Bhuiyan *et al.*, (2002).

### 3.2. Development of modern rice varieties and their diffusion

Bangladesh Rice Research Institute (BRRI) as the authenticated organization for carrying out research and development of high yielding modern rice technology

has so far very successfully developed and released substantial number of rice varieties suitable for growing in different seasons. The level of varietal development by BIRRI can be viewed in figure 2. In fact, there has been an increasing trend in the development of HYV rice varieties over the last three/four decades. It is important to note that, out of the total 59 HYVs evolved by BIRRI so far, there are few varieties which are resistant to some abiotic stresses e.g., salinity, drought, etc. (Saleque *et al.*, 2005, Panauallah *et al.*, 2000). Therefore, it is also imperative that, the diffusion of such stress tolerant varieties would take place in course of time resulting further increase in the coverage of modern varieties.



Source: BIRRI, 2011.

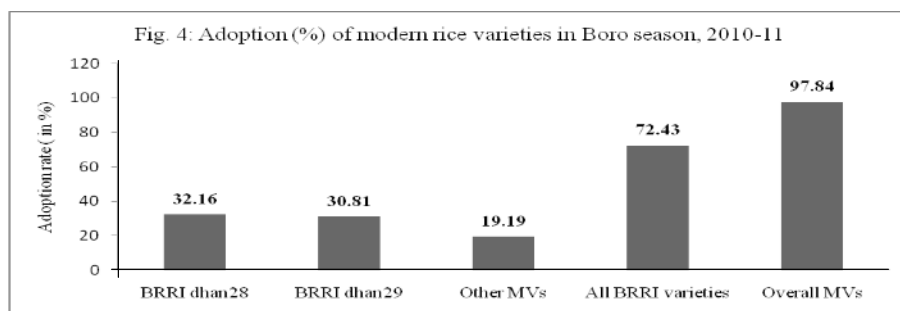
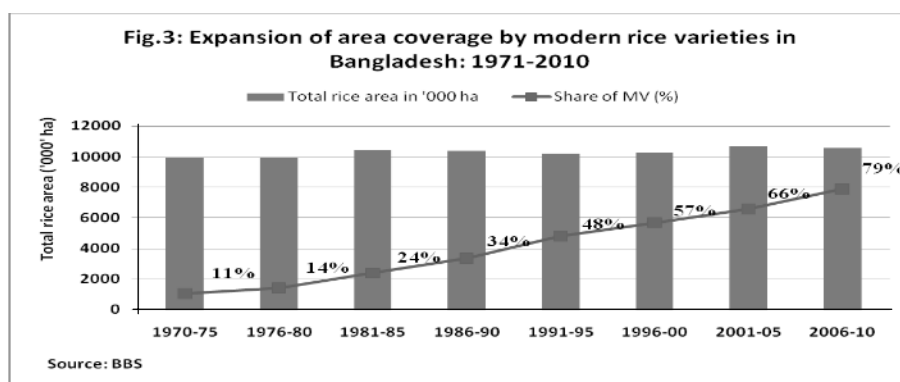
### 3.3. Changes in area devotion to modern rice production in Bangladesh

Since rice is considered as a potential strategic commodity, after independence priority was given by each successive government to boost rice production through adoption of high yielding modern rice varieties (MVs) along with improved production technologies. Remarkable achievement was made with the introduction of MVs in the rice production scenario of Bangladesh. However, the scenario of changes in over all area devotion to modern rice varieties has been depicted in Fig. 3. The average area coverage by modern rice varieties (MVs) in the period of 1970 to 1975 was only 11%, and by 1985 this coverage increased very amazingly to 34% which further increased to 57% in 2000. According to the available statistics, the average coverage of modern rice varieties has reached 79% during 2009. This result is in consonance with some of the earlier studies. (BIRRI, 2010, Jabber and Alam, 2002). The important message is that, this progress in the diffusion of modern rice technologies is the result of: i) development and dissemination of new high-yielding rice varieties; ii) government support in the form of offering public policies like investment in irrigation and flood control, and iii) provision of subsidies on modern inputs and expansion of credit on easy terms etc.

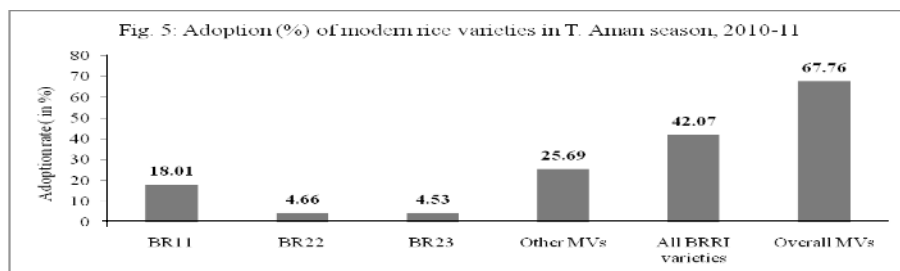
The overall adoption of MVs was relatively slow during the seventies. However, by eighties, the coverage of modern varieties had expanded to about 34%. It is remarkable that, during the later period (2000 onward), the area

devotion to MVs was more luminous and triggered up to 66% in 2005 which further reached to almost 80% in 2009.

The most impressive picture appeared in case of area devotion to MV Boro production. The acreage under modern Boro increased from 0.32 million ha in 1971 to 4.11 million ha in 2007 and further increased to 4.65 million ha in 2010 at the expense of very low lying and risky deepwater Aman rice and upland Aus rices (Alam *et al.*,2007).



Source: BRR1 Annual Review report, 2010-11. BRR1, Gazipur



Source: BRR1 Annual Review report, 2010-11. BRR1, Gazipur.

**Table 3. Annual changes in major cereal crop production over the years 2007-2011.**

| Cereal crops | Annual changes in production (%) |         |         |         |
|--------------|----------------------------------|---------|---------|---------|
|              | 2007-08                          | 2008-09 | 2009-10 | 2010-11 |
| Rice         | 5.9                              | 8.2     | 2.1     | 4.9     |
| Wheat        | 14.5                             | 0.61    | 6.1     | 7.9     |
| Maize        | 49.7                             | -45.8   | 21.6    | 14.8    |

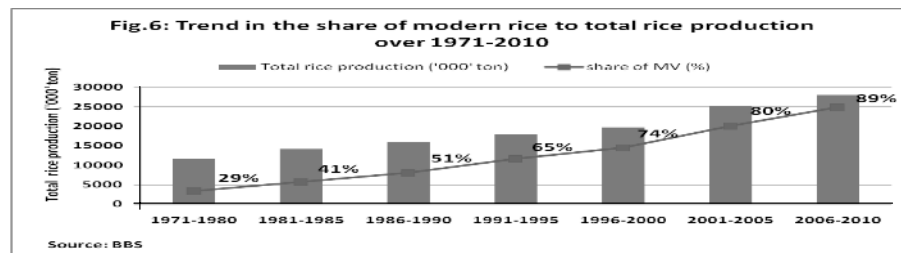
Source: BBS, Agri.Wing, (Major and Minor crops statistics, 2011).

### 3.4. Changes in production of cereal crops

The scenario of annual changes in the production of cereal crops in Bangladesh over the period 2007-2011 can be viewed in Table 3. Production performance of the major cereal crops appears positive. In fact, rice and wheat consistently exhibited positive changes/growth rates over the years 2007-2011, while in case of maize production, the change in 2006-2007 was quite high (about 49%), but also exhibit higher volatility in the next year. However, in the following two years the changes again showed growth of two digits. These results implied that, changes in the production of cereal crops over the recent years were quite positive and consistent.

### 3.5. Contribution of modern rice to total rice production and supply

Despite high pressure on land and other natural resources and an agrarian structure dominated by small and marginal farmers, Bangladesh has made remarkable progress in cereal food production over the last four decades. With the rapid adoption of modern rice varieties at the farm level, the total production of rice has been uplifted very amazingly. It appears in Fig. 6 that during the period 1972 to 1980 the share of modern rice in total production in the country was only 29%, but by the year 1880-1985 this share has increased to 41% and further triggered to 65% in the period of 1991-95. However, the share of modern rice to the total production has jumped to nearly 90% by 2008-09 periods implying a highly impressive contribution of the diffusion of modern rice technologies in the over all supply of cereal food for the ever increasing population in Bangladesh.





### 3.6. Trend in rice yields by season and variety

The long term trend in yield of both modern and indigenous rice varieties are furnished in Table 4. It is evident that at the very initial level ( i.e., in 1972-73), the yield of modern Boro rice was at about 3.0 t/ha, but in the subsequent period of 1975 towards 1996, the yield of MV Boro had declining trend and remained almost stagnant below 3.0 tons/ha. However, with the technological advancement in the later period the yield of MV Boro increased to 3.5 t/ha during 2006 and reached at 3.8 t/ha in 2008. Very unfortunately the yield of MV Aus gradually decreased from 2.43 t/ha in 1975 to below 2.0 t/ha during the period of 1985 towards 2000. After 2000 the yield of MV Aus had an increasing trend and reached at 2.4 t/ha in 2008. In case of modern Aman rice, although the yield was slightly below 2.0 t/ha in 1972, in the subsequent periods' yield had an increasing trend. Probably due to the availability of some new high yielding modern varieties for Aman season, the average yield reached at around 2.5 t/ha in 2009.

**Table 4. Level of rice yield over the years in Bangladesh.**

| Year    | Rice yield (t/ha) |      |      |      |      |      |
|---------|-------------------|------|------|------|------|------|
|         | Aus               |      | Aman |      | Boro |      |
|         | MV                | LV   | MV   | LV   | MV   | LV   |
| 1972-73 | 2.06              | 0.74 | 1.76 | 0.89 | 3.04 | 1.31 |
| 1975-76 | 2.43              | 0.77 | 2.17 | 1.12 | 2.54 | 1.29 |
| 1980-81 | 2.21              | 0.84 | 2.14 | 1.16 | 2.67 | 1.55 |
| 1984-85 | 1.85              | 0.78 | 2.04 | 1.24 | 2.72 | 1.63 |
| 1990-91 | 1.73              | 0.94 | 2.16 | 1.29 | 2.63 | 1.44 |
| 1994-95 | 1.69              | 0.87 | 2.09 | 1.17 | 2.57 | 1.33 |
| 1995-96 | 1.68              | 0.87 | 2.06 | 1.22 | 2.73 | 1.5  |
| 1999-00 | 1.82              | 1.03 | 2.26 | 1.38 | 3.11 | 1.57 |
| 2000-01 | 2.00              | 1.14 | 2.48 | 1.48 | 3.24 | 1.82 |
| 2001-02 | 2.01              | 1.14 | 2.38 | 1.41 | 3.20 | 1.75 |
| 2002-03 | 2.03              | 1.16 | 2.43 | 1.45 | 3.24 | 1.96 |
| 2003-04 | 1.25              | 1.98 | 2.52 | 1.48 | 3.33 | 1.94 |
| 2004-05 | 1.91              | 1.11 | 2.30 | 1.32 | 3.47 | 2.08 |
| 2005-06 | 2.09              | 1.28 | 2.35 | 1.48 | 3.5  | 1.99 |
| 2006-07 | 2.44              | 1.25 | 2.6  | 1.58 | 3.45 | 1.61 |
| 2007-08 | 2.38              | 1.19 | 2.38 | 1.2  | 3.85 | 1.85 |
| 2008-09 | 2.41              | 1.19 | 2.55 | 1.38 | 3.64 | 1.63 |
| 2009-10 | 2.03              | 1.17 | 2.49 | 1.48 | 3.74 | 1.99 |

Source: BBS, 2010; Hand Book of Agricultural Statistics, 2009.

### 3.7. The overall cereal food availability

The scenario of cereal food availability over the years could be viewed in Table 5. The net domestic production of cereal (rice + wheat) was estimated at 17385 thousand tons in 1991-92 which has increased very consistently over the last almost two decades. In 2009-10 the domestic production reached to 29880 thousand tons. In order to keep pace with the increasing demand emanating from population growth, government kept on continuing the importation of food grains. It is worth mentioning that the volume of food grain importation has been more than double compared to the amount of 1991/92 with the amount imported in 2008-09. However, the analysis further revealed that the per capita availability of cereal food grains has amazingly increased over the years. In 1991-92, per capita availability was 165 kg which increased to 188 kg in 2001-02. Taking into consideration of the available estimate of population in the country, the per capita availability has reached to 225 kg in 2009-10. The development and rapid dissemination of the rice technologies during the aforesaid period have contributed much on the availability of cereal food grains in the country.

**Table 5. Food grain (rice + wheat) production and availability in Bangladesh over the years.**

| Year    | Net domestic production* ('000 m.ton) | Private+public import/distribution ('000 m.ton) | Total availability ('000 m.ton) | per capita availability (kg/year) |
|---------|---------------------------------------|---|---------------------------------|-----------------------------------|
| 1991-92 | 17385                                 | 1564  | 18714                           | 165.60                            |
| 1995-96 | 17150                                 | 2434  | 19373                           | 165.50                            |
| 1998-99 | 19632                                 | 5212  | 24324                           | 191.50                            |
| 2001-02 | 23315                                 | 1800  | 25006                           | 188.30                            |
| 2002-03 | 24025                                 | 3220  | 27474                           | 203.50                            |
| 2003-04 | 24698                                 | 2798  | 27323                           | 199.44                            |
| 2004-05 | 23520                                 | 3371  | 26968                           | 194.01                            |
| 2006-07 | 25262                                 | 2417  | 27770                           | 194.20                            |
| 2007-08 | 26793                                 | 3470  | 30169                           | 208.06                            |
| 2008-09 | 28944                                 | 3013  | 31957                           | 216.42                            |
| 2009-10 | 29880                                 | 3454  | 33334                           | 225.45                            |

\* Net production – deduction as seed, feed & wastage etc.

Source: FPMU data base on food situation, MoFDM, GOB, Dhaka, 2011.

### IV. Conclusions

Rice is the main food crop of the country and the level of cereal food supply is largely dependent on rice availability. Because of population and income growth,

the demand for cereal foods (especially for rice) is expected to rise by over 1.5% per annum for the next few decades (Hossain *et al.*, 2009). The main factor of production i.e., land resource base is declining very alarmingly by up to one percent a year. Per capita availability of cultivable land has been declining over time and will reach to 0.05 ha in near future from about 0.064 ha in 2010. The continuation of such decline in availability of cultivable land will pose serious impact on the domestic production and supply of cereal foods. Nevertheless, there has been impressive achievement in technological development in the rice sector. Development and release of modern rice varieties took place at a higher rate during the later periods. Although the area coverage by modern rice varieties (MVs) during the seventies was quite low, in the later periods the dissemination got better momentum. The average coverage of modern rice varieties increased to almost 79% during 2009-10. The progress in the diffusion of modern rice technologies is the result of; i) development and dissemination of new high-yielding rice varieties; ii) government support in the form of offering public policies like investment in irrigation and flood control, and iii) provision of subsidies on modern inputs and expansion of credit on easy terms etc. With the rapid adoption of the modern rice varieties at farm level, the total production of rice has been uplifted very amazingly. Although the share of modern rice in total production was only 29% in the mid-seventies, this share triggered up to nearly 90% by 2009 implying a highly impressive contribution of the diffusion of modern rice technologies in overall supply of cereal foods.

With the technological advancement in the later decade, the yield of MV Boro increased substantially. The yield of MV Aman was slightly below 2.0 t/ha in the seventies, but had an increasing trend in the later periods probably due to the availability of new high yielding Aman varieties. The volume of food grain importation has been more than double in 2008 compared to that of some early periods. The per capita availability of cereal food grains has amazingly increased over the years. The development and rapid dissemination of the rice technologies during the aforesaid period have contributed much on the availability of cereal food grains in the country.

### **Policy Recommendation**

Despite the impressive achievements in food grain production during the last few decades, food supply and availability both at the households and individual level remain a major concern for the government. Since rice is the main staple, food security in Bangladesh critically depends on its adequate availability and accessibility throughout the year. Frequent occurrence of devastating floods, droughts, cyclones, etc. have caused slower agricultural growth in Bangladesh resulting disruption to the overall supply of food grains.

- i) Therefore, continuation of technological advancement in the rice sector would be the key driver for sustaining availability of cereal food grains in the country.
- ii) Area devotion to modern rice has already reached to a plateau implying that horizontal expansion of areas under modern rice production would be difficult. There are vast areas under abiotic stresses (e.g., salinity, flash flood, submergence, etc.), These areas need to be brought under rice production in order to boost up the level of overall productivity. Since advanced research has been able to evolve rice varieties resistant to salinity, flood, submergence (e.g., BRRIdhan47, BRRIdhan44 BRRIdhan51, etc), efforts should be made in order to disseminate the developed rice technologies to the end users in the respective production ecologies. In this connection GO-NGO partnership could be a fruitful approach in disseminating the developed technology to the doorstep of the end users at faster rate. Proper diffusion and adoption of stress tolerant rice varieties would be of great use in sustaining further growth and supply of cereal foods in the country.
- iii) In order to ensure sustained productivity, provision of incentives to the producers through minimum support prices which provides adequate margin over the unit cost of production should be ensured.

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