

Impact of Modern Technology on Food Grain Production in Bangladesh

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The economy of Bangladesh is basically agrarian. At present agricultural sector accounts for about 15.8 percent of gross domestic product (Sixth Five Year Plan 2011 – 2015, GOB, 2012, P. 1). This sector remains the major sector in terms of livelihood and employment with half of the labour force engaged in it (GOB, 2012, P. 1). This sector is the main source of food and nutrition. The sector is dominated by crop agriculture. Within the crop sub-sector rice crop dominates in terms of both cropped area and production which claiming a share of 74 percent and 54 percent respectively in 1996-97 (GOB, 1998). Bangladesh is densely populated country. High pressure of population on limited land is a major constraint to promote agricultural development. Many people live on the verge of starvation or suffering from food deficiency. Every year a lot of money is spent for importing food grains due to the increasing growth of population. The only way to lifting the economy from the existing stage is to produce food-grains to the self-sufficiency level. As such agricultural development is a must for our survival. It may be noted that agricultural development could not be achieved without the proper implication of agricultural inputs in the form of HYV of seeds, fertilizers, irrigation water either individually or in their suitable combination. The suitable combination of HYV of seeds, fertilizers, pesticides and irrigation water can increase agricultural output considerably. In a land scare economy as it is evident in Bangladesh the adoption of modern technology has opened up opportunities of increasing food production and employment facilities. The last few decades have witnessed major transformation of agriculture including changed in its technology, resource base, structure and production process. Now agricultural sector is much more diversified. No detail research on this issue is yet to be conducted. Some studies has been conducted in rural Bangladesh. But these are not sufficient. This is therefore, necessary to analyse the impact of modern technology on food grain production in Bangladesh.

Methodology :

The study is based on secondary data. Secondary data were collected from different published and unpublished documents.

Importance :

The results of the study may be of great use to the policy makers regarding land, modern technology, agricultural production. The farmer would be benefited from the study for cultivate and management of their land. The

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present study will be helpful to the researchers for further studies of similar nature. The result of the study have also great academic importance to the teachers and the students of Economics.

Results and Interpretations :

The crop sector provides staple food such as rice, wheat, pulse, oil etc. Since independent of Bangladesh rice production has increased from 11 million tonne to about 32 million tonne (GOB, 2012). Growth of rice production in the 1980s was about 2.8% per year and 3.5% per year since 1990s. Most of the growth in rice has occurred since late 1980s through adoption of improved varieties of rice supported by rapid expansion of irrigation water. It may be noted that in recent years some policy reforms have been implemented by the government. A few of these are privatization of input distribution, input and food subsidy, import liberalization. The major actor of food-grain production have been development and diffusion of modern varieties of seeds, rapid expansion of ground water irrigation.

Modern technology in the form of seed, fertilizer and irrigation arrived in Bangladesh as early as 1960s. But its popularity and acceptance grew in post liberation period of Bangladesh. In 1965 – 66 area irrigated by modern methods was 2,00,000 acres. While area irrigated by modern methods was 26,38,000 acres in 1979 – 80 (M. Hossain, 1989, P. 27). In 2009 – 10 about 56.9 lakh hectares of land was irrigated. In 2003 – 04 it was 48.33 lakh hectares. The irrigated land area from FY 2002 – 03 to FY 2009 – 10 is shown in Table I.

Available data indicate that area under deep tube well irrigation was 6,60,260 hectares in 2009 – 10 and area under shallow tube well irrigation was 29,31,181 at the same period (BER, 2011, P. 94).

The farmers of Bangladesh have been largely using modern irrigation technology as its inherent advantages are being affordable. A steady rise of irrigation technology has been influencing the use of HYV of seeds, chemical fertilizers and pesticides. The use of modern variety of seeds was negligible up to the end of 1960s but increased gradually in the 1970s. Total area under modern variety of seeds was nearly 3,78,000 acres in 1968 – 69 but it stood about 59,53,000 acres in 1979 – 80 (M. Hossain, 1989, P. 25).

In the 2009 – 10 BADC produced 129083 metric tonnes of seeds (B.B.S, 2011). By the end of 1960s fertilizer consumption had increased to over 4 kilogram of nutrients per acre shown area (M. Hossain, 1989, P. 25). In FY 2008 – 09 the total quantity of fertilizer consumption was 30.05 lakh metric tonnes in FY 2009 – 10. The consumption of urea was highest – 24.09 lakh metric tonnes (BFR, 2011).

In FY 2009 – 10 nearly 44496 metric tonnes boro seeds (where HYV : 44427 metric tonnes and hybrid : 69 metric tonnes) were supplied to the farmers which were 7922 metric tonnes larger than the supply of the previous year. However this distribution is 50 percent of the national demand.

In recent years agricultural sector is much more diversified than three decades go. The last three decades have witnessed vital changes in agricultural sector including changed in its resource base, technology, structure and production process. The growth of agricultural sector has been spectacular at the end of the nineties rather than it is only 1.4 percent in the early nineties. During the last three decades Bangladesh have had tremendous growth in agriculture. Modern technology has made a remarkable impact on output growth. The rapid growth of modern inputs have had a positive impact on food-grain production. Available data indicated that since independence of rice production has increased from 11 million tonne to 32 million tonne (GOB, 2012, P. 5). Most of the growth has occurred since late 1980 through the adoption of modern varieties of rice supported by rapid expansion of irrigation water. During the last two decades more than 80 percent of the increased in rice production has come from the expansion of irrigated boro rice, with reallocation of land from low yielding rain fed Aus rice. Now, three-fourths of rice area is cropped with modern varieties of rice (GOB, 2012).

Table I presents the food-grains production.

Table – I : Food-grain Production (in lakh metric ton)

Food grains	2002-03	2008-09	2009-10
Aus	18.51	18.95	17.09
Aman	111.15	116.13	133.07
Boro	122.22	178.09	183.41
Total rice	251.88	313.17	322.57
Wheat	15.07	8.44	9.69
Maize	1.75	7.30	8.87
Total	268.70	328.96	341.13

Source : Bangladesh Economic Review 2010, GOB, 2011, Dhaka, P. 90

It is evident from the Table I that food grains production in FY 2008 – 09 was only 328.96 lakh metric tonnes of which Aus accounted for 18.95 lakh metric tonnes, Aman 116.13 lakh metric tonnes, wheat 8.49 lakh metric tonnes and Boro 178.09 lakh metric tonnes. Table 5 also shows that total food grains production in FY 2009 – 10 was 341.13 lakh metric tonnes of which Aus accounted for 17.09 lakh metric tonnes, Aman 122.07 lakh metric tonnes and Boro 183.41 lakh metric tonnes. The production of wheat in FY 2009 – 10 stood about 9.69 lakh metric tonnes. It is noteworthy to report that government of Bangladesh took various measures to provide agro-inputs assistance, which include reduction of price of non-urea chemical fertilizers and cash incentives

for diesel. Moreover, introduction and adoption of non-urea fertilizer ensured use of balanced fertilizers by the farmers in turn contributed to the increased yield of Boro. It appears that during the last two decades the Boro crop has had a higher share in total production than the Aman rice which was the major rice crop in Bangladesh. “This indicates a structural shift in Bangladesh’s rice production from a largely weather influenced crop to an irrigated crop.” (Uttam Kumar Deb et. al, Bangladesh Economic Association, Dhaka 2007, P. 666)

Growth in area and production of food grains :

Available data indicated that HYV rice output and acreage have been changing over time. M. Hossain (1999, P. 42) observed that HYV rice acreage had increased from 15% to 52% of the total acreage during mid-seventies to mid-nineties. While, HYV rice output has been increasing from 30% to 70% of total rice output during the same period. Increase in area of rice was responsible for increased production of rice. Uttam Kumar Deb and others (2007) observed that area under rice increased at the rate of 0.7% in the 2000s against 0.6 percent in the 1990s but declining rate (– 0.1%) in the 1980s. Wheat area declined at the rate of 7.2 percent in the 2000s compared to the increasing trend in the 1980s (at the rate of 1.2%) and 1990s (at the rate of 4.3%). They further pointed out that the area under HYV Aus, HYV Aman and HYV Boro increased but the area under the local varieties declined in the 1990s and 2000s. This thing happened mainly due to the adoption of HYV by the farmers of rural Bangladesh through replacing local varieties. Production of food grain showed a higher rate of growth during 1980s to 2000s. Production of rice showed a larger rate of growth (which is 3.7% annual growth) in the 2000s than 3.3 percent in the 1990s and 2.7 percent in the 1980s. Growth rate of Boro production were 8.2%, 7.0% and 4.4 percent in the 1980s, 1990s and 2000s respectively. Growth rate of Aman production were 1.7%, 0.8% and 3.6% in the 1980s, 1990s and 2000s respectively. Growth rate of Aus rice production in the 1980s, 1990s and 2000s were – 3.1%, – 1.7% and 1.4 percent respectively (ibid 2007, P. 674). Growth rate of total food grain production in the 1980s, 1990s and 2000s were 2.4%, 3.5% and 2.9 percent respectively.

Shahabuddin (2010) mentioned that rate of growth agricultural output have increased by 2.7 percent during 1972 – 73 to 1992 – 93. Output grew during 1972 – 73 to 1985 – 86 have increased by 3 percent. He also found that agricultural output grew at a rate of 1.6% during 1990 – 95. Growth rate of output increased sharply by 4.7 percent during 1996 – 2000. While, it has declined to 2.8 percent during the period 2001 – 08 (Shahabuddin 2010). It appears that total rice production increased substantially during the 1990s and the 2000s. It may be noted that by the year 2009 -10 Bangladesh had achieved the highest level of food grain production. This indicates Bangladesh agriculture has experienced a structural change in food grain production.

The growth rate of output at a rate of 2.9 percent in the present decade (2001 – 2010) has been heralded as a success. The structural changes had become possible due to the adoption of the new technology. The steady growth of new technology have had a positive impact on food grain production.

Bangladesh has achieved significant improvement in food production particularly in rice production since the independence of Bangladesh. Since independence rice production has increased from 11 million tonne to 32 million tonne (GOB, 2012). This significant improvement in agriculture can largely be attributed to rapid expansion of modern technology in Bangladesh over the last few decades.

Suggestions for Policy Implications :

- (1) Strengthening of agricultural extension and support services for promotion of agricultural activities.
- (2) Interdisciplinary knowledge of economists, agriculturists and environmentalists should be incorporated in the modern farming and related research.
- (3) Diversification of farming system should be encouraged in order to help improve economic condition of the farmers.
- (4) In order to increase agricultural output and yield an integrated land use policy is essential.

Conclusion :

Now agricultural sector is much more diversified than a few decades ago. The last three decades have witnessed major changes in agriculture including changed in its technology, resource base and production process. During the last three decades Bangladesh have had a tremendous growth in agriculture. The rapid expansion of the new technology have had a positive impact on food grain production. Agricultural output grew by 4.7 percent during 1996 – 2000. The growth rate output in present decade is 2.9 percent. The growth rate of 2.9 percent of the present decade (2001 – 2010) has been heralded as a success. The significant improvement in agriculture can highly be attributed to a steady dissemination of the new technology over the last three decades.

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