Liberalization of the Bangladesh’s Agriculture Sector: Lessons Learned from the 1980s and the 1990s

Prepared By,
Golam Kabir
Najmul Hossain
Moutushi Rahman

December 2011
<table>
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<tr>
<th>Acronym</th>
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<tr>
<td>BADC</td>
<td>Bangladesh Agricultural Development Cooperation</td>
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<td>BBS</td>
<td>Bangladesh Bureau of Statistics</td>
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<td>GOB</td>
<td>Government of Bangladesh</td>
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<td>GDP</td>
<td>Gross Domestic Product</td>
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<td>MOA</td>
<td>Ministry of Agriculture</td>
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<td>NCA</td>
<td>Non-Crop Agriculture</td>
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<td>SFYP</td>
<td>Sixth Five Year Plan</td>
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<td>SOE</td>
<td>State Owned Enterprises</td>
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<td>TSC</td>
<td>Thana Sales Centre</td>
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<td>UNDP</td>
<td>United Nations Development Program</td>
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<td>WB</td>
<td>World Bank</td>
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EXECUTIVE SUMMARY

The objective of this study is to produce an analytical overview of the degree of success of liberating the Bangladesh agriculture sector, with a special focus on the 1980s and 1990s. The study assess the historical, institutional and market conditions and structures that enabled it to attain the objective of considerable agricultural growth leading to significant welfare gains to both farmers and consumers.

Bangladesh like many developing nations focused on a tightly regulated macro-policy environment. It has however gone through significant changes in its policies and made remarkable progress in its economies. This reflects the nation’s shift in political philosophy from heavy state control to a more liberalized economic environment.

Two waves of agricultural reform took place from the 1980s to mid-1990s. The first wave swept in early 1980 till the middle of the decade. During this time subsidies on inputs were cut back and domestic trading of inputs were liberalized. After the mid-1980s till the mid-1990s, import of inputs were liberalized, public distribution of grains subsided and private trading in grain markets locally and internationally increased supplemented with decreases in public programs for grain distribution. This was categorized as the second wave of reforms that took place.

Reforms and changes in agricultural policies continued over the course of fifteen years and by the end of it, markets for both farm inputs and outputs had been significantly liberalized from public control. In fact, by South Asian standards, Bangladesh had liberalized its economy significantly in the past two decade in comparison to its neighbors where reforms had been more limited. Liberalization did not occur singularly with agriculture but rather across the whole economy. There was trade liberalization, privatization, financial sector and fiscal reform all compounded together to impact the economy as a whole.

The most significant impact of agricultural reforms was the liberalization of mainly two agricultural inputs; fertilizers and irrigation pumps. The availability of these two inputs caused a colossal effect on rice production. Before going into details of the reforms that took place, it is important to understand reasons for the reforms to begin with. Government distribution and control was proving to be tedious with much bureaucratic drawbacks. In addition foreign aid to the country was dwindling and there was constant pressure from donor agencies to liberalize market systems.
A gradual liberalization of markets for modern inputs in agriculture was carried out between 1978 to the 1990s. As a result of these reforms, the role of the Bangladesh Agricultural Development Corporation (BADC) in marketing and distribution of fertilizer, irrigation equipment, power tillers, pesticides and seeds significantly decreased.

Initially BADC was the sole organization procuring chemical fertilizers from not just domestic factories but foreign sources also. The government fixed fertilizer prices to be uniform throughout the country and restricted fertilizer imports. During the late 1970s and early 1980s, BADC started to withdraw from retail and wholesale markets at thana levels which were the primary distribution points, in an attempt to begin the liberalization process and to allow private stakeholders to take over. BADC was then instead appointed the role of a regulatory body for the fertilizer distribution process. Thus the main distributers to farmers became cooperatives and private dealers.

The setup that proceeded the retirement of BADC in fertilizer distributions had its many setbacks. Control was given in the hands of only a few private dealers resulting in a private oligopoly model. Government’s control of prices also interfered with natural demand and supply curves resulting in price variations and shortages. Eventually free import from the world market began around the early 1980s to 1992 prompting greater competition and hence quality and availability of fertilizer. Subsidies were slowly removed dropping from $83 million in 1979/80, to $57 million in 1983/84, to $40 million in 1988/89, to only about $0.6 million in 1992/93.

Use of fertilizer had increased among farmers and the coupled with the use of irrigation pumps, rice production had significantly improved. I must be noted that although distribution channels had been largely privatized, urea production was still done by the government. Due to poorly planned timing of urea exports by the government, during the peak season of urea use and bureaucratic controls set on the distribution system caused a huge shortage in urea scaring the government into reverting back to its old subsidized programs.

Until the mid- 1970s, other than the programs initiated by the government, there was hardly any private initiation in the development of modern irrigation. Since there was not much domestic capacity for producing diesel engines and pumps, much of the equipment provided by BADC programs was imported using foreign aid. The market for irrigation equipment was small, mostly private and usually nonagricultural. Therefore, liberalizing the import trade became the key element of market liberalization in agricultural equipment.

In 1980/82 the BADC sold all its low-lift pumps at subsidized prices to private dealers. This received a good response from the farmers. In 1986-87 the removal import restrictions on small diesel engine was followed by the withdrawal of duty on imports and standardization
restrictions in 1988-89. These actions caused a drastic drop in the price of engines which further promoted the use of these engines. Eventually all subsidies were removed and demand still sustained. Irrigation pumps were and still are mainly used for an extra season of cropping in the winter. Winter months are usually dry and cultivating rice is not possible without sufficient water. Irrigation pumps meant not only channeling water from neighboring brooks, streams and rivers but also access to ground water. Rice production expanded during the 1980s and 1990s well ahead of population growth till the 2000s where although still not self-sufficient, it was much closer than it ever was in the past decades.

It is worth noting that although a large number of shallow irrigation machines were brought to Bangladesh for irrigation and other agricultural purposes, the use of these machines extended way beyond agricultural purposes into nonagricultural ones. From powering three-wheeler transport vehicles to acting as motor power to small boats to acting as a backup generator, the uses of the diesel engine are numerable. Thus the import of this machine had a great spill-over effect on overall rural economy and development.

Once broad trade liberalization was initiated in the 1990s, Bangladesh successfully used the private sector trade to help stabilize rice and wheat prices following major production shortfalls. Private sector imports were encouraged through a policy of zero tariffs and other measures. This process reduced the need for large government stocks. Food grain (rice and wheat) was typically procured at fixed prices through direct purchases of grain from farmers or traders.

Other than trade liberalization, exchange rate policies were also liberalized. Reducing exchange rates in the 1990s in Bangladesh aimed to rationalize the structure towards a more simple and transparent system of customs tariffs and to encourage imports of agricultural inputs. It also prompted exports growing from 3 percent of GDP in 1975 to 12 percent of GDP by 2000. The GDP-trade ratio itself increased from 11 percent in 1975 to 17 percent in 1990. Regarding subsidies, there was a large and clear savings for the state from withdrawing subsidies. In 1981, the subsidies on fertilizers and irrigation cost 15% of all tax revenues. In 2008, total subsidies is 8% of revenue expenditure as a percentage of GDP.

Although the reforms of the 1980s and 1990s can be termed a success story, it would be misleading to say however that the story was not without its glitches. Although not immediate, adverse effects of the reform process slowly surfaced and implications are still being struggled with today. The introduction genetically engineered seeds from abroad meant more production, but it also meant more use of inputs was needed and it was more susceptible to natural disasters like flood. This meant marginal farmers were more vulnerable because of their limited resources in terms of investing in inputs and ability to cope with production losses due to natural disasters. Another concern that is taking root now, is the over usage of fertilizer on
cultivated land over time and its effect on the soil fertility. Seeping of chemical fertilizer in rivers and ponds can affect its fish and fauna population with adverse effects.

Nevertheless, the liberalization process of agriculture in Bangladesh can be termed a definite success. The most important factor to the success of Bangladesh’s liberalization process was phasing the reforms in stages. Starting with simpler things, document success and then tackle the more difficult tasks all the while having strong monitoring and evaluation. To the credit of the reformers, they timed the reforms very well taking advantages of changes in global prices, market economies and trade policies which helped compound the positive effects of the reform and cushion the drawbacks of it. It also helped that research organizations and NGOs were producing more evidence of ineffective government distribution bodies and policies. They helped instigate changes by the government and political parties. Donor pressure, a politically sensitive paradigm, can be effective if they can deflect criticism from domestic reformers.

The Bangladesh experience portrayed that a limited role of the government seemed to have the most positive impact on the economy. The role of the government should be limited to policy reforms, and public and semi-public goods. The long term effect of privatization has resulted in much positive impacts along the length and width of the economy of Bangladesh. There is more diversification in different sectors such as agriculture, less reliance on the government and much unintended positive effects of reforms. It is important to continue the evaluation of these policy changes however so as to ensure these impacts are not short lived, do not have negative ramifications and can be part of greater implications in the future.
1 Introduction

1.1 Background

In the mid-1970s, the erstwhile U.S. Foreign Secretary Henry Kissinger termed Bangladesh as a future “basket case.” In the decades of the 1970s and 1980s the country experienced sluggish agricultural growth and a steady population growth of over 2.7 percent, projecting an ominous future whereby there was not enough land to feed its burgeoning population. The uncomplimentary doomsday prediction of Henry Kissinger haunted Bangladesh’s psyche.

The 1990s however witnessed a remarkable turnaround in Bangladesh’s agriculture fortunes, and its ability to feed its people. The population doubled, the arable land area did not change much, but the farmers became more productive and the country became nearly food-sufficient. What happened?

A silent revolutionary change transformed the agricultural sector. Starting in the late 1980s and through the mid-1990s many of the government agriculture sector controls and regulations were either scrapped or streamlined. Agricultural machinery imports (diesel engines and power tillers) were liberalized and barriers to introduction of new crop varieties were removed. In addition, replacing a government-owned monopoly distribution system with a competitive private sector for distribution of key inputs, such as fertilizer, transformed Bangladesh’s agriculture sector.

1.2 Objective of the Study

The objective of this study is to produce an analytical overview of the degree of success of liberating the Bangladesh agriculture sector, with a special focus on the 1980s and 1990s. The study will assess the historical, institutional and market conditions and structures that enabled it to attain the objective of considerable agricultural growth leading to significant welfare gains to both farmers and consumers. How much of the success can be attributed to the liberalization policies can be gauged only after looking into factors that may have complemented the effort.

The study probes into how and why policy changes favoring a market driven resource allocation took precedence over a centralized planning effort. It shall highlight the lessons learned in identifying key catalysts in bringing the reforms and those who resisted unbundling the status quo. The study describes the trends in agricultural growth and the market structure through the present period. This will enable to assess if the changes of the 1980s and 1990s were
sustainable leading to a competitive environment or did the policies regress to government controls and interference.

1.3 Structure of the Report

The report comprises of six chapters. The chapter after the introduction will explain briefly an overview of the agricultural sector in Bangladesh followed by the third chapter which delves into the major economic and agricultural reforms that took place during the 1980s and the 1990s. The fourth chapter shows the impact the reforms had on the farmers, the consumers and the economy in general during the last two decades. The fifth chapter discusses the reasons behind the reform. The sixth and final chapter shares the lessons learned from such a reform process and future implications of it.
2.1 Bangladesh Agriculture from Independence to Present

Bangladesh gained its independence in 1971 and is one of the most densely populated countries in the world. Although a high poverty rate prevails, the United Nations has acclaimed Bangladesh for achieving tremendous progress in human development and economic progress. Before an overview of the agricultural sector is shared, it would be useful to look at a general overview of Bangladesh itself in terms of demographic, social and economic indicators -Table 1.

Table 1: Bangladesh Demographic and Socioeconomic Indicators

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<thead>
<tr>
<th>Indicator</th>
<th>Estimate</th>
<th>Year</th>
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<tr>
<td>Population</td>
<td>142,319,000</td>
<td>March 2011</td>
</tr>
<tr>
<td>Population Density</td>
<td>1142/km2</td>
<td>2010</td>
</tr>
<tr>
<td>Per Capita Income (PPP)</td>
<td>$1,643</td>
<td>2010</td>
</tr>
<tr>
<td>Labor Force by Occupation</td>
<td>Agri=45%; Indus=30%; Serv=25%</td>
<td>2008</td>
</tr>
<tr>
<td>Adult Literacy Rate</td>
<td>47.9%</td>
<td>2011</td>
</tr>
<tr>
<td>Infant Mortality Rate</td>
<td>50.73 deaths/1,000 live births</td>
<td>2011</td>
</tr>
<tr>
<td>Life Expectancy</td>
<td>69 years</td>
<td>2011</td>
</tr>
<tr>
<td>Population below Poverty Line</td>
<td>31.5 (est.)</td>
<td>2011</td>
</tr>
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</table>

Source: Several published and unpublished reports. Includes: Bangladesh Bureau of Statistics, Statistical Year Book, 2010; Bangladesh Population Census 2010; World Bank, MDG Indicators

Agriculture is the nation’s principal source of food and nutrition. Although the present sectorial share is only 22% of GDP, it was approximately 33% in the 1980s and 29% in the 1990s (Bangladesh Bureau of Statistics, Statistical Yearbook of Bangladesh (BBS), various issues). In terms of generating employment agriculture can be credited to absorb 46% of the labor force, with its employment share being much higher in the 1980s (58%) and the 1990s (63%) (BBS, various issues).

Albeit, the GDP and employment share has declined over time, the agriculture sector is more diverse and intensive today. Non-rice and/or non-cash crop contributions have been increasing steadily in recent years. The fishery and livestock, if considered within the ambit of the agriculture sector, has witnessed a robust growth. Finally, the agribusiness market encompassing processed agricultural inputs and outputs have evolved as a sector with considerable domestic and export growth.

Table 2 portrays the share of the agriculture sector as a percentage of GDP from 1980 till 2009.
Table 2: Broad Sectoral Share in GDP (%) at Constant Price (Base year: 1995-96)

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<tr>
<td>Agriculture</td>
<td>33%</td>
<td>31%</td>
<td>29%</td>
<td>26%</td>
<td>25%</td>
<td>22%</td>
<td>21%</td>
<td>21%</td>
<td>20%</td>
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<tr>
<td>Industry</td>
<td>17%</td>
<td>19%</td>
<td>21%</td>
<td>25%</td>
<td>26%</td>
<td>28%</td>
<td>30%</td>
<td>30%</td>
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<td>Service</td>
<td>50%</td>
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<td>Total</td>
<td>100%</td>
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Source: BBS, Statistical Yearbook, various issues

Bangladesh’s agriculture comprises four sub-sectors: crop, fisheries, forestry and livestock. Within crop sub-sector, food grain, particularly rice crop dominates the country’s agricultural scenario in terms of both cropped area and production, claiming a share of 78 per cent and 77 per cent respectively in 2010 (BBS 2010). Table 3 summarizes the growth performance of the agricultural sub-sectors by growth as a percentage of change, and as a percentage share of GDP.

Table 3: Growth Performances of Agriculture Sub-Sectors, 1980-2010

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<th>FY80-90</th>
<th>FY91-00</th>
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<td>Agriculture Sector (A+B+C+D) (Growth as % Change)</td>
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<td></td>
<td>2.5</td>
<td>2.8</td>
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<td>A) Crops and horticulture</td>
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<td>2.7</td>
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<td>B) Animal farming (Livestock)</td>
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<td>C) Forest and related services (Forestry)</td>
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<td>2.7</td>
<td>3.5</td>
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<td>D. Fisheries</td>
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<td>2.3</td>
<td>8.1</td>
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<td>Agriculture Sector (A+B+C+D) (Share as % of GDP)</td>
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<td></td>
<td>31.2</td>
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<td>A) Crops and horticulture</td>
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<td>B) Animal farming (Livestock)</td>
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<td>C) Forest and related services (Forestry)</td>
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<td>D) Fisheries</td>
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<tr>
<td></td>
<td>4.8</td>
<td>5.3</td>
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Source: Government of Bangladesh Sixth Five Year Plan 2011

Although the percentage share of GDP for crops and horticulture has decreased from the 1980s, the growth as a percentage of change has increased significantly since the 1980s. Decline in percentage share of GDP of agriculture does not necessarily reflect negatively of the sector. It merely means there is an increase in the contribution to GDP from other sectors such as Industry as portrayed in

Table 2 before and Figure 1.
2.1.1 Crop Sub-Sector

Of all the sub-sectors in agriculture, the crop sub-sector is predominant and according to the Government of Bangladesh (GOB) sixth year plan, accounts for 60 percent of the sectoral value-added. Rice is dominant within crop production (others being wheat, pulses and jute) and its production and prices play an important role in domestic policy making. This food grain accounts for 71% share of the gross output of all crops hence its performance by large determines the growth in the agricultural sector (SFYP 2011).

According to the Bangladesh Bureau of Statistics, since independence, rice production has tripled from 11 million tons (milled rice) to about 31 million tons. In 2008/09 (BBS 2009) rice production has grown from 2.8% per year in the 1980s to 3.5% per year since 1990/91 (BBS 2009). Key changes in policies during the 1980s and 1990s regarding agricultural inputs and trade policies influencing seed, fertilizer and agricultural machinery, contributed greatly directly and indirectly to rice production. Much of production growth occurred since late 1980s due to the adoption of improved rice varieties supported by rapid expansion of ground water irrigation

BBS also claims, over 80 percent of the increase in rice production during the last two decades has come from the expansion of irrigated Boro rice in the dry season, with reallocation of land from low yielding rain fed Aus rice -Figure 2- Over three-fourths of the rice area is now cropped with improved varieties developed by Bangladesh Rice Research Institute (BRRI) and Bangladesh Institute of Nuclear Agriculture (BINA) in collaboration with international research centers (SFYP 2011).
Wheat is the other food stable although it is a minority in the Bangladeshi diet. Wheat has had a respectable growth till the late 1990s, after which it started to give way to maize. According to the Ministry of Agriculture, the agro-ecological conditions for growing maize are more favorable resulting in higher productivity. In addition, it has a stable and increasing market as feed for the expanding livestock sector. Currently, maize production exceeds that of wheat production putting a greater strain on rice to meet the growing food demands.

The other major crops are jute, wheat, potato, different types of pulses, chilies and onions and vegetables, sugarcane, tobacco, and tea. In recent years, the cropped area under boro rice, wheat, maize, potato and vegetable has increased.

2.1.2 Non-Crop Agriculture

Despite the dominance of rice, the structure of agriculture has changed slowly with some gains mainly for fisheries. Livestock has remained virtually stagnant, while forestry products registered a small gain. Error! Reference source not found. depicts the percentage changes in performances of the four subsectors over the last 30 years. It may be mentioned here that the outputs of these subsectors have a higher nutritional and economic value as compared to production in the crop subsector. All animal protein for human consumption is supplied by the fishery and livestock sub-sectors. Moreover, depending upon land and climatic suitability,
production and earnings can be higher per unit of land and water resources from non-crop agriculture if production, processing and marketing systems can be effectively organized.

**Figure 3: Bangladesh: Structure of Agriculture, FY81-FY10**

Source: Government of Bangladesh Sixth Five Year Plan 2011. (Note: Sectoral shares are in current prices)
3.1 Reforms in the 1980s and 1990s

Two waves of agricultural reform took place from the 1980s to mid-1990s. The first wave swept in early 1980 till the middle of the decade. During this time subsidies on inputs were cut back and domestic trading of inputs were liberalized (Cabral 2006). After the mid-1980s till the mid-1990s, import of inputs were liberalized, public distribution of grains subsided and private trading in grain markets locally and internationally increased supplemented with decreases in public programs for grain distribution. This was categorized as the second wave of reforms that took place.

Reforms and changes in agricultural policies continued over the course of fifteen years and by the end of it, markets for both farm inputs and outputs had been almost completely liberalized from public control. In fact, by South Asian standards, Bangladesh had liberalized its economy significantly during the 1990s in comparison to its neighbors where reforms had been more limited (Ahmed 1996 cited in Cabral 2006).

These reforms on a large part appear to have been successful. Markets in inputs and outputs are functioning well without government subsidies or control. As an example of success Bangladesh rice productions have increased in the current decade and at the same time, wholesale and retail prices have fallen around half of what existed in relative terms to 1980s (Cabral 2006 and BBS 2010).

Liberalization did not occur singularly with agriculture but rather across the whole economy. There was trade liberalization, privatization, financial sector and fiscal reform all came together to impact the economy as a whole. It is important to include their story.

3.1.1 Major Economic Reforms

After independence, Bangladesh like many developing nations focused on a tightly regulated macro-policy environment. It has however gone through significant changes in its policies and made remarkable progress in its economies. This reflects of the nation’s shift in political philosophy from heavy state control to a more liberalized economic environment. Table 4 summarizes the various economic reforms that have taken place from independence well into the 1990s.
Table 4: Major Economic Reforms in Bangladesh, 1980-1990

1. **Agricultural Policy**

   - Liberalization of input markets
   - Decreased role of government in input distribution
   - Deregulation of input prices
   - Reduction of subsidies on agricultural inputs
   - Liberalization of agricultural import
   - Liberalization of output markets with producers price incentives
   - Gradual elimination of distribution of food at subsidized prices
   - Price stabilization through procurement policy
   - Liberalization of import on food grain

2. **Trade and Industrial Policy**

   - Reduction of maximum tariff rates
   - Rationalization and simplification of the tariff structure
   - Elimination of quantitative restrictions on imports
   - Simplifications of industrial regulations

3. **Privatization and Public Enterprise Reforms**

   - Denationalization
   - Reduction of excess labor in State Owned Enterprises
   - Rationalization of jute mills
   - Improve operational performance of public utilities
   - Privatization of selected public manufacturing and commercial enterprises

4. **Fiscal Policy Reform**

   - Expand the base of the value added tax
   - Reform personal and company direct taxes
   - Strengthen the tax administration
   - Adjust prices of current expenditure to less than the growth of nominal GDP
   - Reduce subsidies and administrative costs
   - Improve project aid utilization
   - Reduce the operating deficit of Bangladesh railway

5. **Financial Sector Reform**

   - Implement reforms aimed at a market-oriented system of monetary management
   - Privatization of NCB and allowing banking in the private sector
   - Interest rate liberalization
   - Strengthen commercial bank loan recovery programs

Source: North South University (NSU) research proposal, *Understanding Economic Reform* [unpublished document]
**Exchange Rate Policy**

Right after independence, during the 1970s, Bangladesh saw it fit to keep a fixed exchange rate. Then in 1979, the state instituted a flexible exchange rate marking the taka to the currencies of the country’s then major trading partners. In 1985, the state under a World Bank and International Monetary Fund program installed a policy of frequently adjusting the nominal exchange rate. This program was part of an overall macroeconomic policy reform. By the beginning of the 1990s Bangladesh unified its two-tiered foreign exchange market (Ahmed and Haggblade 2000) meaning it unified the government-managed exchange rate and the open market rate based on trade of remittances. The extent of overvaluation had dropped from 28 percent during the 1970s to 8 percent during the early 1990s (Rahman 1994 as quoted in Ahmed 2000) and remained around 5-7 percent in the mid-90s.

**Trade Liberalization**

After independence, high tariffs and quantitative restrictions dominated trade policy. Major steps were taken towards the liberalization process at the end of the 1980s. These reforms focused on (1) removing quantitative restrictions, (2) reducing tariff rates, (3) rationalizing the tariff structures, and (4) simplifying trade procedures. Initial focus was on deregulating trade and removing quantitative restrictions. Quantitative restrictions fell from 47 percent in the 1970s to 36 percent in 1990 (Rahman 1994 as quoted in Ahmed 2000). The import policy regime is still pushing towards a free trade regime.

Starting from mid-80’s tariff and non-tariff barriers were substantially reduced in the country making it one of the fastest liberalizers in the region. Eventually the tariff structure was rationalized and import procedures were streamlined. These reforms contributed significantly to increasing the trade-GDP ratio which increased from 21.7 percent in 1985-86 to about 40 percent in 1996-97. A liberal Import Policy Order (IPO) for 1995, based on a policy of limited protection and only on grounds of health, security and religion, accelerated the pace of openness of trade. Overall tariff rate ranged from 10 to 300 percent, and the weighted average was 93 percent in 1982/83 (Ahmed and Haggblade 2000). The average fell to 30 by 1994 and 21 percent by 1998-99 (World Bank 2000) –
Figure 4.
In the South Asian region, Sri Lanka seems to be the most progressive when it comes to relaxing tariffs especially compared to India and Pakistan -- Figure 5. In comparison with the South East Asian economies, the move towards trade liberalization has been at a slower pace in this region. However, Bangladesh fares less favorably when compared with the East Asian and Latin American countries (Hossain and Rashid 2000).

The combined effect of exchange rate policy changes and trade liberalization resulted in a spur of growth in exports. The total value of exports increased from $0.94 billion in 1983/84 to
$2.975 billion in 1995/96. Foreign exchange reserves rose from $0.962 billion in 1988/89 to $3.75 billion in 1995/96 (Ahmed and Haggblade 2000). Many claim though that exports rose due to preferential trade arrangement such as quota and GDP and not necessarily because of trade liberalization. Others claim the rapid liberalization contributed to de-industrialization because of rapid import growths (NSU).

**Privatization**

At the time of its independence in 1971, Bangladesh inherited a large, private sector dominated economy. The mass migration of non-Bengali entrepreneurs resulted in the nationalization of 725 industrial and commercial enterprises. However while this ‘nationalization’ process was underway, during 1972-75 there was disinvestment to private ownership of 122 small companies, and by 1979, another 150 small and medium sized enterprises were privatized (Hossain and Zakaria 2000). Table 5 lists the number of industrial enterprises that were privatized in Bangladesh from 1972 to 2000.

**Table 5: Industrial Enterprises Privatized in Bangladesh, 1972-2000**

<table>
<thead>
<tr>
<th>Period</th>
<th>Number of Enterprises</th>
<th>Rice &amp; flour mills</th>
<th>Printing &amp; paper</th>
<th>Engineering</th>
<th>Textile</th>
<th>Metal Work</th>
<th>Vegetable oil</th>
<th>Chemical</th>
<th>Wood products</th>
<th>Miscellaneous</th>
</tr>
</thead>
<tbody>
<tr>
<td>1972</td>
<td>122</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rice &amp; flour mills-20</td>
<td>Printing &amp; paper-8</td>
<td>Engineering-12</td>
<td>Textile-11</td>
<td>Metal Work-7</td>
<td>Vegetable oil-5</td>
<td>Chemical-4</td>
<td>Wood products-3</td>
<td>Miscellaneous-52</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wood products-9</td>
<td>Jute products-9</td>
<td>Food products-5</td>
<td>Glass &amp; optical-3</td>
<td>Rubber Products-16</td>
<td>Ice and cold storage-7</td>
<td>Hotel-2</td>
<td>Trading-3</td>
<td>Miscellaneous-20</td>
</tr>
<tr>
<td>1981-86</td>
<td>150</td>
<td>Tanneries &amp; Bones-5</td>
<td>Metal work-5</td>
<td>Rice &amp; flour mills-8</td>
<td>Textile-27</td>
<td>Vegetable oil-12</td>
<td>Printing &amp; paper-2</td>
<td>Films-1</td>
<td>Engineering-10</td>
<td>Soap &amp; chemicals-12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Jute products-35</td>
<td>Food products-3</td>
<td>Glass &amp; optical-1</td>
<td>Rubber products-1</td>
<td>Ice &amp; cold storage-5</td>
<td>Hotel-1</td>
<td>Trading-6</td>
<td>Miscellaneous-16</td>
<td></td>
</tr>
<tr>
<td>1986-91</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>1991-96</td>
<td>13</td>
<td>Textile-6</td>
<td>Chemicals-4</td>
<td>Steel &amp; Engineering-2</td>
<td>Sugar &amp; Food-1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1996-2000</td>
<td>6</td>
<td>Textile-1</td>
<td>Sugar &amp; Food-1</td>
<td>Miscellaneous-4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Hossain and Zakaria 2000
The New Industrial Policy (NIP) of 1982 encouraged privatization for more production of goods and services. There was a transfer of more than 150 industrial and commercial enterprises from public to private ownership during the 1981/86 period (Hossain and Zakaria 2000).

Due to the poor performance of state owned enterprises (SOEs) the 1991 industrial policy espoused privatization of all SOEs with the exception of those belonging to defense, telecommunications, power, air travel, and railway. Full ownership of enterprises was also permitted. The lack of popularity of SOEs was due to their huge losses. Subsidies are a major proportion of the GDP which could instead contribute to various social and infrastructural activities and increase scope of expenditure and employment in other sectors. The SOEs in addition had huge loan defaults from Nationalized Commercial Banks (Hossain and Zakaria 2000).

It is becoming increasingly costly for the government to subsidize loss making government enterprises. The private sector is also affected in their costs of production through higher interest rates, and other costs associated in dealing with corrupt and inefficient government producers of goods and services. Acceleration of the privatization process requires strong governance with commitment and competency. At present the government has pushed towards more privatization of previously state owned enterprises, such as telecommunications and airlines. Privatization of telecommunications alone has had a colossal positive effect on the economy.

**Fiscal Policy Reforms**

The objective of the nation’s fiscal and monetary reforms has been to reduce the public sector in order to expand the scope of private entrepreneurship in the economy and contain excessive volatility and price increases. This required reduced public expenditure, budget deficits and decreasing the money supply. Public expenditure on public goods such as infrastructure, technology and institutional development was kept the same due to reluctance of private firms to invest in these sectors.

The reform measures yielded significant results. Government revenue as a percentage of GDP increased from an average of 8.5 percent in the mid 1980s to 12 percent in 1995/96 (Ahmed and Haggblade 2000). This was possible due to the successful introduction of VAT (value-added tax) in 1991-92 which balanced the decrease in trade taxes. Stronger tax administration reduced the dependence on foreign aid and increased public revenue (North South University unpublished document). Although donor agencies like the World Bank continue to urge on limiting public expenditure, powerful political lobbies continue to be a major force behind this unnecessary wastage.
Financial Sector Reforms

In contrast, very little has been done in terms of the financial market oriented reform. Between 1990 and 1994 commercial banks had an excess of liquidity that they could not lend to productive users because the demand for investment was stagnant. This problem was compounded with the state’s unwillingness to reduce interest rates. In addition the government practice of selling bonds and saving certificates at high interest rates while retiring public debt to the banking system has created a vicious cycle that limited productive investment.

In addition the banking systems were and still are inundated with bad debts and a dysfunctional atmosphere in the capital market. Overall the problem of the country’s financial market reforms is enmeshed in its fundamental political problems. Weakness of the regulatory apparatus of the government has made reforms ineffective and subverted. This weakness of the regulatory apparatus could trickle-down and constrain the positive impact of the successful changes in other macro-policies unless there is parallel success in financial market reforms.

Thus all these separate but inter-related liberation process compounded together to significantly influence and impact the liberation process of the agricultural sector too. The next section proceeds to tell the separate story of agricultural liberalization during the 1980s and 1990s.

3.1.2 Agricultural Reforms in the 1980s and 1990s

Under pressure from foreign donors and the increasing realization that various direct interventions were unstable and unproductive in the long term fiscally and economically, a gradual liberalization of markets for modern inputs in agriculture was carried out between 1978 to the 1990s. As a result of these reforms the role of the Bangladesh Agricultural Development Corporation (BADC) in marketing and distribution of fertilizer, irrigation equipment, power tillers, pesticides and seeds significantly decreased. In the late 1990s, liberalization and privatization of input markets coincided with a large expansion in tube well irrigation and winter (Boro) season rice cultivation.

Once broad trade liberalization was initiated in the 1990s, Bangladesh successfully used private sector trade to help stabilize rice and wheat prices following major production shortfalls. This process reduced the need for large government stocks. Food grain (rice and wheat) is typically procured at fixed prices through direct purchases of grain from farmers or traders. From the
inception of BADC well into early 1990s, subsidized sales of grain through ration programs were the major distribution channels. As part of reforms undertaken in the early 1990s, however, major ration channels were shut down and by the end of the decade approximately 85 percent of public sector distribution were targeted to poor households through direct distribution channels such as Food for Work and Food for Education (FAO 2003).

Import liberalization of wheat and rice occurred in the early 1990s. Then, in 1994, private food grain exports were liberalized in India. This was part of an ongoing broader macroeconomic reform including exchange rate depreciation within South Asia. The combination of liberalization of Bangladesh’s import trade and India’s export trade, led to India replacing Thailand as the main source of Bangladesh rice imports due to lower transport costs and quicker delivery to Bangladesh. This allowed Bangladesh to have private imports when domestic production of rice fell, which then balanced out during normal sustainable production years (FAO 2003).

Private sector imports were vital for national food security following the floods of 1998, which destroyed more than 20 percent of the monsoon season rice crop (about 10 percent of the annual production). Following the flood, the Government of Bangladesh adopted the cautious strategy of moderate government imports to supply government distribution channels while actively encouraging private sector imports through a policy of zero tariffs and other measures. By following this trade-oriented stabilization strategy, Bangladesh was able to increase domestic supplies quickly and successfully stabilize prices (FAO 2003).

The success of this strategy had several conditions. First, India had good rice production at low costs and a policy climate that encouraged private exports. Second, the private sector trade in Bangladesh involved hundreds of small traders importing small quantities of rice and was thus very competitive. Third, the Government had clear political will to encourage private import trade through removing tariffs and surcharge and pushing customs officials to expedite imports of rice. Fourth, due to the reason mention earlier regarding exchange, trade and fiscal policies, Bangladesh had sufficiently large foreign exchange reserves to pay for rice imports (Ninnco 2001).

The next few sections will narrate separate stories of the reform processes that various agricultural inputs, machinery and agricultural extension systems went through during the 1980s to the 1990s. However their stories cannot be told without first introducing the main state distributor of agricultural inputs, BADC.
3.1.2.1 The Bangladesh Agricultural Development Cooperation (BADC): Public Control during the 1970s

It was during the great famines of 1943 and 1974 that general concern about market malfunction and trader misconduct motivated the introduction of broad public marketing controls. It also sparked policies regarding large-scale direct public marketing of food-grains (Nuimuddin and Haggblade 2000). During the 1960s and later the early 1970s, the Bangladesh economy was extensively under public control especially regarding markets and ownership of key enterprises. The government established state run distribution corporations like the BADC which eventually also became a regulatory body.

Bangladesh Agricultural Development Corporation (BADC), the successor of the East Pakistan Agricultural Development Corporation was established in 1961. BADC was a semi-autonomous corporate body under the Ministry of Agriculture, whose function was the daunting task to distribute agricultural inputs to the whole of Bangladesh.

Their main objective was to increase agricultural production in Bangladesh. Some of their mandatory or primary functions were: to make suitable arrangements throughout Bangladesh on a commercial basis, for the procurement, transport, storage and distribution to agriculturists of essential supplies such as seed, fertilizers, plant protection equipment, pesticides, and agricultural machinery and implements; to take over and manage seed multiplication and livestock breeding farms and fruit nurseries; and to assist, encourage and promote the manufacture of improved agricultural machinery and implements (BADC 2009). They had the optional functions in relation to mandatory responsibilities among others to give loans in kind; to assist, encourage and promote the establishment of industries for the processing of agricultural produce, formulating or manufacturing of insecticides, pesticides, fungicides etc; and to organize the supply, maintenance and operation of lift-pumps and tube-wells, and set up light workshops for running repairs (BADC 2009).

Under the Sheik Mujib government from liberation to 1975, the focus was on an economy with much state intervention. Reliance on markets increased again during the military regime that followed in the second half of the 1970s (Cabral 2006). BADC during that decade developed an elaborate national organization for delivering goods and services to farmers soon establishing a virtual monopoly over fertilizer and agricultural equipment markets while conforming to government pricing and related policies (Chowdhury and Haggblade 2000).

In addition, imports were controlled by a licensing system, which was intended as a means of both ensuring allocation of foreign exchange to priority areas and protecting import substitute industries (Banglapedia 2006). The corporation has however since been replaced by liberalized and deregulated input markets starting from the early 1980s.
3.1.2.2 Fertilizer Market

Chemical fertilizers subsidized by the government have been used in Bangladesh since the green revolution took place in the late 1950s and early 1960s. Chemical fertilizers were used in Bangladesh, primarily on tea estates in 1959-60 (Ahmed 2000). By the time BADC was established in 1961, the use of these chemical fertilizers had already spread to small and micro farmers. By 1977-78, BADC had sold 354,000 nutrient tons of fertilizers (equivalent to 725,000 material tons) to farmers in Bangladesh (Ahmed 2000).

By decree, BADC was the sole organization procuring fertilizers from not just domestic factories but foreign sources also. The government also fixed fertilizer prices to be uniform throughout the country and restricted fertilizer imports (Ahmed 2000). The system of distribution involved tedious and bureaucratic steps before the fertilizer reached the fields of farmers which later proved to be inefficient and corruptible. BADC shipped the fertilizers first to transit warehouses, then to intermediate warehouses at strategic points and finally to Thana Sales Centers (TSCs)\(^1\). The warehouses and TSCs functioned as both wholesale and retail points selling fertilizers to licensed private dealers and also directly to farmers.

There were 67 intermediate warehouses and 423 TSCs between 1963 and 1978 for the whole country (Ahmed 2000). Around the time of 1978 to 1983, BADC started to withdraw from retail and wholesale markets at thana levels which were the primary distribution points, in an attempt to begin the liberalization process and to allow private stakeholders to take over (Chowdhury and Haggblade 2000). BADC was then instead appointed the role of a regulatory body for the fertilizer distribution process. Thus the main distributors to farmers became cooperatives and private dealers.

The share of cooperatives in total sales was a considerably smaller percentage, only 12 to 17 percent compared to the rest which were accounted for by private dealers. Three or four private dealers would serve 7 to 10 villages (Ahmed 2000). According to regulations set by BADC, dealers were not supposed to sell outside a defined area and had to procure their fertilizers from specified TSCs. Since prices were fixed, distributors benefitted from a commission based on the distance from the TSC to the operation center. Maintenance of registers was required by the dealers which were then occasionally inspected by BADC officers (Ahmed 2000).

The setup that proceeded the retirement of BADC in fertilizer distributions had its many setbacks. Although the private distributors were licensed to sell the fertilizer only in assigned regions, what resulted was distributors selling to places that they deemed were more

\(^1\) Thana: Administrative unit consisting of 80 to 90 villages
profitable, whether it be a different district, at the border or even in front of fertilizer factory gates (Ahmed 2006 and Key Informants 2011). Control of distribution eventually rested among a few private dealers. The trend had shifted from a government monopoly to a private oligopoly model.

In addition to the control of fertilizer distribution being in the hands of a few, the government fixed prices of fertilizers interfered with natural demand and supply curves in the fertilizer market resulting in price variation and shortages (Ahmed 2006). There was the government price, the distributor price and the intermediary price. Although the BADC was appointed as a regulator body, they were more specialized in distribution and had neither the training nor the mindset to act as efficient price and distribution regulators (Key Informants 2011).

According to many key informants who were part of BADC during the early 1980s, many BADC personnel left the country or their jobs, while other joined the more profitable and successful seed business. Therefore as a regulatory unit they failed to efficiently monitor the private distribution of fertilizer. As a result during the years of 1982 and 1984, the government abolished the licensing requirement and the restriction on movement (except the 8 km border zones with India) of fertilizers (Ahmed 2000).

During the decade of 1982 to 1992, deregulation of the price of fertilizers took place and private traders started to directly purchase from factory gates and port points and free import from the world market began. The fertilizer trade expanded rapidly, and by 1988 nearly 8,000 wholesalers and 50,000 retailers operated competitively in the fertilizer market. The share of private trade rose to 75 percent in 1989 and nearly 100 percent by 1992 (Ahmed 2000). This suggested the response to privatization was a positive one although, according to a few informants interviewed, suggested that there prevailed fear of collusive behavior amongst a handful of farmers and middlemen in varied locations across the country.

In addition to the benefits reaped from privatization of the distribution process, the lift of subsidies on fertilizers also helped balance the state’s accounts. Detailed calculations indicate that the budgetary subsidy on fertilizers dropped from $83 million in 1979/80, to $57 million in 1983/84, to $40 million in 1988/89, to only about $0.6 million in 1992/93 (Ahmed 1987 and Renfroe 1991, cited in Ahmed 2000 and Key Informants from MOA 2011). Even the small amount of subsidy in 1993 was for nothing more than to correct minor and trace-element deficiencies in lacking soils.

Unfortunately the seeming success of privatization of the fertilizer distribution system backfired in 1995. Although the distribution of fertilizers was privatized, production of urea had remained mostly in the public sector. A severe urea shortage shocked the fertilizer market between
December 1994 and March 1995. Unfortunately it resulted in a partial reversal of the liberal reform process that was working so well; the government decided to go back to subsidization.

**Figure 6: Production and Import of Urea, 1980-2006**

![Figure 6: Production and Import of Urea, 1980-2006](image)

Source: BBS Statistical Yearbook, various issues

*Figure 6 show that urea production was on the contrary, in 1995, the highest in that decade, so why the shortage in urea? There were two conflicting beliefs regarding the crisis, that of the government and that of the private dealers. The government blamed the crisis on the wholesale privatization of the fertilizer distribution system, arguing that the private sector created an artificial shortage by hoarding and selling at higher prices, smuggling across borders, and deliberately manipulating the allotment orders and lifting schedules formulated by the public production agency (Ahmed 2000). However, prior and during the crisis, the government had decreased fertilizer prices and had also issued the revised Fertilizer Control Ordinance in 1995 (MOA 2010) in consultation with private sector and IFDC for quality control and regulation of fertilizer prices.*

The private fertilizer traders contend that the crisis erupted because the government took two contradictory steps at the same time: (1) reducing fertilizer prices in the domestic market (perhaps a pre-election strategy), which boosted domestic demand, and (2) exporting fertilizer without considering the newly inflated demand – *Figure 7* and *Figure 8*. In addition, the private traders believed that the newly set administrative controls worsened the market situation (Ahmed 2000).
It was later concluded that the crisis stemmed from the culmination of several factors. First, it was the peak season for fertilizer use when the crisis occurred. Second, the large export of urea between June 1994 and January 1995 drastically reduced domestic availability during this peak period. Third, the introduction of administrative controls during the crisis destabilized the distribution system and hurt crisis management. Although questionable, there seems to be little evidence of private smuggling across borders (Chowdhury and Haggblade2000).
After the urea crisis, in 1995/96 the new government reversed the subsidy policy to subsidize fertilizers, so that the direct subsidy on fertilizer in 1996/97 was estimated at $105 million. The 1983/84 expenditure was equivalent to about 14 percent of total public development expenditure on agriculture and rural development, while the 1979/80 amount was equivalent to 28 percent of such expenditure (IFPRI 1985). During 2004-05 and 2005-06 the government provided Taka 261 and Taka 371 crores respectively as subsidy for the phosphate and potash fertilizers (IFPRI 1985). The annual government development budget for agriculture around that period was around Taka 644 crore for 2004-05 and Taka 1114 crore for 2005-06. Hence the subsidy on phosphate and potash fertilizers were approximately 40.5% and 33% of the agriculture development budget.

Today the fertilizer industry is still heavily subsidized by the government who pays around Taka 40,000 per metric ton as subsidies (D-8 Secretariat 2008). The amount of money Bangladesh has to pay for subsidies is controversial however. The major stake of urea is procured in Bangladesh by state owned Bangladesh Chemical Industries Corporation [BCIC]. According to an article published by the D-8 Organization, this enterprise has incorporated several unreasonable clauses in the purchase process, being suggested by an organized racket, to stop most of the potential foreign suppliers from making offers at much lower price. In addition to questionable actions of the BCIC, Bangladesh’s choice in trade partners have also affected the price it has to pay for fertilizers.

Bangladeshi state owned enterprise as well the ministry concerned determine prices of urea based on certain publications which so happen to be mostly owned by traders of fertilizer manufacturers. In reality, in most cases, prices in such publications are not near reality. The Bangladesh government signed contracts with countries like Saudi Arabia, Kuwait etc., for importing urea on state-to-state contract at the price of US$ 870 plus per ton, while, for example, Israel offers the same urea to its friendly nations at the rate of US$ 300 per ton. As Bangladesh continues total ban on Israel, Bangladeshi businessmen or state owned enterprises are not able to buy urea from any of such sources at lower prices (D-8 Secretariat 2008).

It was further revealed in the D-8 meeting 2008, Malaysia, that some vested interest groups were not above forcing the present government into a difficult situation by creating shortage of fertilizer. Members of the D-8 suggested, the Bangladesh government can take steps in simplifying the bidding process of BCIC thus giving chance to potential suppliers, who can supply urea to Bangladesh at a much cheaper price with assurance of immediate shipment (D-8 Secretariat 2008). Figure 9 shows some consumption trends of fertilizers in other parts of Asia.
3.1.2.3 Pesticides Market

One of the main constraints to increasing crop production is pests. According to an estimate by Ministry of Agriculture (MOA), Government of Bangladesh, 2002, the annual yield loss due to insect pests alone is 16 percent for rice, 11 percent for wheat, 20 percent for sugarcane, 25 percent for vegetables, 15 percent for jute and 25 percent for pulse crops.

In addition to the role of fertilizer distribution in 1961, BADC was given the task of procuring plant protection materials, i.e. pesticides, while the Department of Agricultural Extension was supposed to implement crop protection schemes. By the end of the decade however, procurement and distribution were liberalized for several reasons. The government recognized that the bureaucratic agency was not well suited or equipped for pest control on time for the farmers. In addition, there were numerous complexities in storing and handling the poisonous materials and in dispensing them to farmers (Ahmed 2000).

Until 1974, the Government provided 100 percent subsidy on pesticides to farmers to promote their use. The subsidy was reduced to 50 percent in 1974 and withdrawn completely in 1979. The pesticide business was transferred to the private sector. However, to deal with emergency situations, the government maintained a buffer stock of 15-20 metric tons of pesticides. After the withdrawal of subsidy and the resignation of BADC from pesticide procurement and distribution, private importers began to import and distribute pesticides through private
dealers and general retailers of consumer goods. The government however restricted import of pesticides to certain brands and dealers approved by Ministry of Agriculture (BADC 2009). This as expected resulted in an oligopolistic model as was witnessed with fertilizer distribution and contributed to very high prices for pesticides despite the absence in import tariffs. Around 1989 the restriction on import by brand names of pesticides was finally lifted (Ahmed 2000).

The use of pesticides increased again during the 1990s, reaching 14,340 metric tons of formulated products or 2,462 metric tons of active ingredients in 1999, costing over one billion Taka in foreign exchange (US$ 18.5 million) (MOA 2002). Increased rice area, increase in cropping intensity and an increase in the area under high yielding varieties led to the increased consumption of pesticides. By 2002, 96 pesticides (including one botanical) with 304 trade names have been registered in Bangladesh. In the year 1999, 2,462 tons of active ingredients of pesticides were used in Bangladesh over an area of 13.63 million hectare, which is equal to 180 grams of active ingredients per hectare per year (MOA 2002).

Figure 10 portrays the import of various types of pesticides from 1980 to 2001. Pesticides include insecticides, fungicide, herbicides and disinfectants. Insecticides consist of the lion’s share of Bangladesh’s pesticide imports. Prices were already high for imports of pesticides without taxes or restrictions on brands. Even after the lift of the restrictions on import by brand names of pesticides, import prices in Bangladesh were not affected as the global price of insecticides continued to increase due to higher consumption demand and increase in fossil fuel prices – Figure 11.

**Figure 10: Import of Pesticides by Types from 1980-2001**

Source: FAOSTATS (Food and Agriculture Organization of the United Nations Statistical Database) 2011
Presently, according to the Ministry of Agriculture of Bangladesh, pesticides and plant protection activities are now completely privatized. The government’s role is confined to qualitative and quantitative aspects of plant protection, for example, pest’s surveillance and monitoring, developing and providing pest warning systems, advisory service to farmers, traders and others dealing with pesticides. The state also provides quality control of pesticides marketed by the private sector.

For the Sixth Five Year Plan 2011-2015, from the Ministry of Planning, the Integrated Pest Management (IPM) program will be intensified and expanded in regard to pest control and environmental degradation due to pesticide uses. The program also plans to provide advisory systems to the farmers on appropriate plant protection measures. In addition it will act as a control to marketing of adulterated fertilizer and pesticides and maximum residual levels. The program encourages collaboration among the local government representatives, extension workers and NGOs, to expand the IPM program.

### 3.1.2.4 Seeds Market

Traditionally, Bangladeshi farmers had been growing their own seeds for personal use and sale to markets. It was even common for some farmers to specialize in seed production. These traditional markets have been the primary distribution channel in the country long before the 1960s. Since the inception of the BADC, the corporation has been involved in supplementing these traditional seed markets. By the late 1960s, 19 seed multiplication farms were operational under BADC (Ahmed 2000). They were responsible for producing and distributing improved seeds of various crops. All seeds had to pass the seed certification requirements as
set by the government to ensure quality although this system faced bureaucratic shortcomings and corruption within the regulatory system (Ahmed 2000).

Below is a summarized table – Table 6, of the distribution of improved seed by BADC. Figure 12 focuses only on the three main crop varieties Aman, Aus and Boro. Figure 13 shows the seed requirement of the nation which was far beyond the distribution supplied by BADC.

Table 6: Distribution of Improved Seed by BADC in Metric Tons, 1980-2005

<table>
<thead>
<tr>
<th>Year</th>
<th>Aus</th>
<th>Aman</th>
<th>Boro</th>
<th>Wheat</th>
<th>Maize</th>
<th>Jute</th>
<th>Potato</th>
<th>Mustard/Oil Seed</th>
<th>Lentil</th>
<th>Pulses</th>
<th>Vegetables</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1979-80</td>
<td>515</td>
<td>1,231</td>
<td>605</td>
<td>14,022</td>
<td>3,713</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>20,086</td>
</tr>
<tr>
<td>1984-85</td>
<td>234</td>
<td>1,877</td>
<td>1,216</td>
<td>19,199</td>
<td>3,296</td>
<td></td>
<td></td>
<td>49</td>
<td></td>
<td></td>
<td></td>
<td>25,871</td>
</tr>
<tr>
<td>1989-90</td>
<td>1,580</td>
<td>2,947</td>
<td>1,030</td>
<td>16,952</td>
<td>7,471</td>
<td></td>
<td></td>
<td></td>
<td>222</td>
<td>32</td>
<td></td>
<td>29,980</td>
</tr>
<tr>
<td>1994-95</td>
<td>550</td>
<td>3,038</td>
<td>2,918</td>
<td>15,456</td>
<td>6,702</td>
<td>503</td>
<td>6,702</td>
<td>222</td>
<td>22</td>
<td>32</td>
<td></td>
<td>29,443</td>
</tr>
<tr>
<td>1999-00</td>
<td>330</td>
<td>6,226</td>
<td>7,475</td>
<td>8,473</td>
<td>214</td>
<td>209</td>
<td>6,175</td>
<td>240</td>
<td>80</td>
<td>43</td>
<td>10</td>
<td>29,475</td>
</tr>
<tr>
<td>2004-05</td>
<td>458</td>
<td>7,232</td>
<td>15,054</td>
<td>13,705</td>
<td>356</td>
<td>162</td>
<td>7,609</td>
<td>336</td>
<td>139</td>
<td>76</td>
<td></td>
<td>45,127</td>
</tr>
</tbody>
</table>

Source: Seed Wing, Ministry of Agriculture 2007

Figure 12: Seed Distribution of Three Major Crop Varieties by BADC, 1980-2005

Source: Bangladesh Agricultural Development Cooperation 2009
In the interest of seed industry development, in 1993, entry of the private sector was allowed through the National Seed Policy. The private dealers were allowed to import and sell seeds except for five notified crops (rice, wheat, sugarcane, potato and jute). Import was only allowed if procedural formalities concerning them and restrictive requirements were fulfilled. The seed policy of 1993 made provisions for active participation of the private sector and NGOs. The private sector took up programs for production of hybrid rice seeds in the country (Chowdhury and Haggblade 2000). They were allowed to import any improved germplasm for research and development and to develop its own facilities for producing foundation seeds. At the same time the removal of government restriction on the introduction of new vegetable seeds allowed more variety as well as longer seasons for fresh vegetables in markets throughout the country.

Key informants, who were part of the BADC during the late 1980s and early 1990s, claimed many BADC personnel were sent to the U.S.A. for training so there was greater capacity building in BADC for seed distribution than there was for fertilizer distribution (Ahmed 2000). The trainees had better technology guidance and were able to bring hybrid seeds in a regulated environment (Cabral 2006). Rice and potatoes were popular items that were invested in (Ahmed 2000).

In terms of production, at present, BADC, still bears the main responsibility of producing and supplying HYV seed. The HYV is a cross breed of the African dwarf variety and local rice strains developed by the BRRI. Popular HYV varieties replaced existing local varieties making farmers increasingly dependent on them. Barely 200-300 varieties of local rice exist in Bangladesh.
compared to the five thousand types of indigenous rice that used to exist. Although introduction of HYV varieties has increased rice production, increased input demand (due to its higher fertilizer and water requirements) has increased investment costs making farmers more vulnerable to losses (Chowdhury and Uddin 2009).

Although BADC bears production and supply responsibility, its capacity is insufficient to meet local demands for high quality seeds. In 2006-07 BADC supplied 57,046 tons of seeds to meet the local demand for high quality seeds which was only 15% of the total demand of the country (BADC 2008). In 2007, with the attack of two floods and one cyclone this shortage became more pronounced. During this time Hybrids entered under the auspices of local corporate NGOs in the cyclone affected areas.

During 2007-08, total hybrid seed requirement was 308,680 tons, in contrast to the total seed sales of 109,500 tons. In 2008-09, the requirement was 374,000 tons and the supply was 117,985 tons. This amount was sold by BADC, Department of Agricultural Extension (DAE), the private sectors and NGOs. It is clear the government and private sectors combined are still unable to fill the seed requirement gap (Chowdhury and Uddin 2009). BADC has 22 regional, 42 district and 36 thana sales centers all over the country. The process of seed marketing by BADC is shown in the chart below – **Figure 14**.

**Figure 14: BADC Seed Marketing Flowchart**
Private sector marketing is similar. There are marketing centers in different regions that supply to seed dealers. Private sectors import 95 percent of rice seed hybrids. According to the Ministry of Agriculture, the outgoing Boro season of 2009, 11,000 tons of hybrid seeds were required. Only 2,500 tons were produced locally and the rest were imported from China and India (Chowdhury and Uddin 2009).

Currently farmers themselves produce the seeds including non-government organizations like BRAC. Companies such as Ispahani, Energypac, Square and Getco have also become involved in producing seeds and supplying seeds. These companies have two ended links investing for research and development programs into hybrid seeds and their storage and processing. Table 7 shows the production of seeds in the private sector, NGOs and multinational companies at present along with state owned distribution and production channels; BADC and DAE. It is evident that the state run enterprises produce and distribute a much larger percentage of the seeds, especially rice (Chowdhury and Uddin 2009).

Table 7: Year Wise Seed Supply, 2007-2009

<table>
<thead>
<tr>
<th>Name of Seed</th>
<th>Total seed sold 2007-08</th>
<th>BADC+DAE 2007-08</th>
<th>Private sector 2007-08</th>
<th>Total seed sold 2008-09</th>
<th>BADC+DAE 2008-09</th>
<th>Private sector 2008-09</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice</td>
<td>109500</td>
<td>90700</td>
<td>18800</td>
<td>117985</td>
<td>97985</td>
<td>20000</td>
</tr>
<tr>
<td>Wheat</td>
<td>39200</td>
<td>39200</td>
<td>0</td>
<td>41050</td>
<td>40550</td>
<td>500</td>
</tr>
<tr>
<td>Potato</td>
<td>39700</td>
<td>37000</td>
<td>2700</td>
<td>40500</td>
<td>37500</td>
<td>3000</td>
</tr>
<tr>
<td>Maize</td>
<td>4970</td>
<td>470</td>
<td>4500</td>
<td>3000</td>
<td>500</td>
<td>2500</td>
</tr>
<tr>
<td>Jute</td>
<td>2915</td>
<td>1565</td>
<td>1350</td>
<td>2965</td>
<td>1580</td>
<td>1385</td>
</tr>
<tr>
<td>Vegetables</td>
<td>930</td>
<td>73</td>
<td>857</td>
<td>1093</td>
<td>75</td>
<td>1018</td>
</tr>
<tr>
<td>Pulses</td>
<td>2808</td>
<td>2808</td>
<td>0</td>
<td>3103</td>
<td>3103</td>
<td>0</td>
</tr>
<tr>
<td>Oil seeds</td>
<td>1477</td>
<td>1477</td>
<td>0</td>
<td>1748</td>
<td>1748</td>
<td>0</td>
</tr>
<tr>
<td>Spices</td>
<td>384</td>
<td>283</td>
<td>101</td>
<td>454</td>
<td>304</td>
<td>150</td>
</tr>
</tbody>
</table>

Source: Seeds and Agriculture Division, Ispahani Foods Ltd. 2009

It has been difficult for the private sector to flourish in the seed market. Appointment of effective dealers is problematic in addition to the supply process to farmers. Ispahani officials claim there is a lack of seed stocks. Good quality breeder seeds are needed for stock seeds which are unavailable by the private sector for a couple of reasons. One, they do not get any financial support from the government to produce better quality seeds whereas BADC is heavily subsidized (and can therefore also offer lower prices) and is an unfair competitor. Private sectors are also not considered under the seed production industry, hence hindering access
enjoyed by BADC. Due to lack of funds, these companies also do not have their own research and development unit (Chowdhury and Uddin 2009).

The state run research agencies that do exist now, BRRI, the BINA and the Agricultural Universities all lack coordination amongst themselves and have not done enough research on producing varieties of rice that are adaptive to soil quality and climate change. They only supply 10-15 percent of the nation’s seed requirement (Chowdhury and Uddin 2009). Finally certification and quality control is so poor that it can account for 12 to 15 losses in production due to poor quality seeds.

3.1.2.5 Agricultural Machinery

3.1.2.5.1 Irrigation: Low Lift Pumps using Diesel Engines

In the early 1960s the BADC initiated low-lift pump irrigation using diesel engines and distribution pipes, mainly to reclaim the haor\(^2\) areas of the Sylhet and Mymensingh districts. Initially BADC owned, maintained, and operated these pumping sets to supply water to groups of farms. It did so using a flat charge per hectare, which covered only about 60 percent of the operating cost. Eventually the system proved to be unwieldy and expensive. As a result BADC had to consider changing its public irrigation policy from expensive, large-scale projects to low-cost, small-scale ones (Ahmed 2000).

Due to these drawbacks, by end of the 1960s BADC started introducing some reforms. By the mid-1970s a rental system was introduced so that BADC only had to provide well-functioning pumping sets. The farmers were required to organize into irrigation groups, supply all diesel fuel costs, and pay a share of the maintenance cost at flat rates per hectare of irrigated land. Farm groups were also responsible for water management and wages of pump operators.

Until the mid-1970s, other than the programs initiated by the government, there was hardly any private initiation in the development of modern irrigation. Since there was not much domestic capacity for producing diesel engines and pumps, much of the equipment provided by BADC programs was imported using foreign aid. The market for irrigation equipment was small, mostly private and usually nonagricultural. Therefore, liberalizing the import trade became the key element of market liberalization in agricultural equipment. Before the mid-1980s, two import restrictions were in effect:

\(^2\) A haor is a lake-like depression in a low-lying, marshy stretch of land
1. Private imports of specific makes and models of diesel engines for irrigation approved by the Standardization committee in the MOA was allowed only; and,

2. Private import of pumps for irrigation was not allowed except with MOA permission, foreign exchange through a donor-funded project, and no objection from the Ministry of Industries (Ahmed 2000).

In 1980/82 the BADC sold all its low-lift pumps at subsidized prices to private dealers. This received a good response from the farmers. In 1986-87 the removal of import restrictions on small diesel engine was followed by the withdrawal of duty on imports and standardization restrictions in 1988-89 (Ahmed 2000). These actions caused a drastic drop in the price of engines which further promoted the use of these engines.

It is worth noting that although a large number of shallow irrigation machines were brought to Bangladesh for irrigation and other agricultural purposes, the use of these machines extended way beyond agricultural purposes into non-agricultural ones. From powering three-wheeler transport vehicles to acting as motor power to small boats to acting as a backup generator, the uses of the diesel engine are numerable. Thus the import of this machine had a great spill-over effect on overall rural economy and development.

3.1.2.5.2 Irrigation: Tube Wells

In the early 1960s the Bangladesh Water Development Board initiated the first tubewell program, drilling 90 tubewells, in northern Bangladesh. Although the project was 100 percent subsidized, for many years, it failed to attract any farmers. At the point that low-lift pump programs had reached saturation points, BADC decided to shift its focus on deep tubewells instead. At the same time that BADC was installing deep tube-wells, cooperative societies like the Comilla Academy for Rural Development, was successfully experimenting with shallow tubewells with a capacity equivalent to one-eighth to one-half of BADC tubewells. They were drilling them at a price much cheaper than BADC's. The academy also implemented a training program to develop private-sector tubewell installation capacity.

In 1970 BADC started a modest tubewell irrigation program for farmers initially operating these wells on the same principles as low-lift pumps. In about 1978 the corporation was asked to install tubewells for fanners at subsidized (20 - 30 percent) rates. This somewhat competed with the prices for shallow tubewells.

In 1983-85 BADC sold all its tubewells for irrigation to farmers and cooperatives at subsidized prices. By early 1989 the cost of a shallow tubewell (complete with sinking, pipe, pump, and engine) to irrigate four to five hectares of land had fallen below taka 20,000 (US$600), which is
about 60 percent of the subsidized price for such equipment through BADC. The subsidies on deep tubewells were removed in 1992 and BADC was removed from the procurement and distribution of minor irrigation equipment. As a result, between 1988 and 1996 irrigated area expanded at a rate roughly twice as quickly as had been achieved between 1978 and 1986. Table 8 and Figure 15 portray the demand for the different irrigation methods used over the years.

**Table 8: Irrigation by Methods, 1980-2005**

<table>
<thead>
<tr>
<th>Year</th>
<th>Low Lift Pump</th>
<th>Deep Tubewell</th>
<th>Shallow Tubewell</th>
<th>Total/TubeWell</th>
<th>Canal</th>
<th>Traditional</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1979-80</td>
<td>621</td>
<td>181</td>
<td>55</td>
<td>236</td>
<td>122</td>
<td>590</td>
<td>1,569</td>
</tr>
<tr>
<td>1984-85</td>
<td>581</td>
<td>441</td>
<td>300</td>
<td>742</td>
<td>148</td>
<td>503</td>
<td>1,973</td>
</tr>
<tr>
<td>1989-90</td>
<td>657</td>
<td>428</td>
<td>1,045</td>
<td>1,473</td>
<td>178</td>
<td>629</td>
<td>2,937</td>
</tr>
<tr>
<td>1999-00</td>
<td>742</td>
<td>664</td>
<td>2,291</td>
<td>2,955</td>
<td>172</td>
<td>317</td>
<td>4,187</td>
</tr>
<tr>
<td>2004-05</td>
<td>802</td>
<td>717</td>
<td>3,027</td>
<td>3,744</td>
<td>-</td>
<td>488</td>
<td>5,035</td>
</tr>
</tbody>
</table>

Source: BBS Statistical Yearbook, various issues

**Figure 15: Irrigation by Methods, 1979-2005**

The budgetary subsidy on BADC's low-lift and tubewell irrigation program was estimated at $66.7 million in 1979/80 and $33 million in 1983/84 (Rashid 1986 cited by Ahmed 2000). Although the subsidiaries were budgetary losses, they definitely promoted growth in the market for modern inputs and in the development of agricultural production. Their contribution

3.1.2.6 Cultivation Equipment: Power Tillers

At its inception BADC began a mechanized cultivation scheme based on tractors, but such experiments had limited success. In about 1968 the Bangladesh-Japan Cooperative Scheme on agricultural machineries successfully introduced power tillers for plowing. No special public agency was created to market and distribute the tillers, as had been the case for other inputs. Imports of power tillers started in 1989.

Since it was not the part of the responsibility of BADC to distribute these power tillers, private importers and distributors began to perform the function of distributing these power tillers instead. Medium to large farms purchased power tillers to meet their own requirements and rent to neighbors. While the government did not control the domestic market it did restrict the import market. Before the mid-1980s, the Ministry of Agriculture had to approve the make and model of all power tillers to be imported. Import of agro-machines, including power tiller, was liberalized - resulting in the growth of power tiller utilization. This growth however was limited due to its usefulness only to farmers who could afford it, medium and large farmers. Small and micro-farmers were not affected by the liberalization of this input. Table 10 provides a complete summary of all the reforms that took place in agriculture.
Figure 16: Major Economic Reforms, 1980s-1996

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Other Inputs</strong></td>
<td>1980 Pesticide subsidies eliminated. Import and distribution liberalised passing from MinAg to private sector</td>
<td>1987 Fertiliser: private traders allowed to buy at factory gates and ports</td>
<td>1990 Seeds: new policy proposed</td>
</tr>
<tr>
<td><strong>Fertiliser</strong></td>
<td>1978-84 Fertiliser: BADC withdraws from retailing and thana wholesaling, Licensing abolished, movement restrictions removed (except for 8km border zone) Prices deregulated Subsidy reduced, from 50% of cost in FY1979 to 21% by FY1982</td>
<td>1992: Fertiliser: free import from world market 1994-95: Fertiliser shortages see re-imposition of government controls on dealers, with licensing, quotas, and delimitation of sales areas</td>
<td></td>
</tr>
<tr>
<td><strong>Marketing</strong></td>
<td>1992 Rural rationing withdrawn. Statutory rationing abolished 1991-93: Reduced public procurement</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Trade</strong></td>
<td>1991-93 Liberalised grain trade Reduced tariffs on imports: Import-weighted average tariffs</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>FY 94</td>
<td>FY 96</td>
<td>FY 02</td>
</tr>
<tr>
<td><strong>Primary commodity</strong></td>
<td>27.2%</td>
<td>13.2%</td>
<td>9.4%</td>
</tr>
<tr>
<td><strong>Intermediate inputs</strong></td>
<td>22.9%</td>
<td>22.7%</td>
<td>16.2%</td>
</tr>
<tr>
<td><strong>All commodities</strong></td>
<td>24.1%</td>
<td>17.0%</td>
<td>9.7%</td>
</tr>
<tr>
<td><strong>Overall</strong></td>
<td>1988/89 to 1995/96</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Input subsidy: down from 2.53% to 0.83% value of output Price support down from 0.20% to 0.01% of output PSE down from 2.73 to 0.84</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: (Cabral 2006)
The impact of the reforms can be termed a success based on a few major observations. Although the population had increased from around 100 million in the 1980s to nearly 140 million in 2000s and the land area had not increased, farmers were much more productive and the country nearly gained food self-sufficiency. Much of the change in agricultural productivity occurred in just 16 years (late 1980s to mid-2000s). Reforms in the external sector including those specifically in agriculture significantly changed the dynamics of market economy in Bangladesh with clear implications of success. The most significant benefit of trade liberalization was that of relaxing quantitative restrictions and reductions in nominal and effective tariffs and adoption of a unified and moderately flexible exchange rate policy. Although partial reforms started in 1980s, liberalization of the Bangladesh trade regime since 1991 is generally considered more systematic and comprehensive.

Reducing exchange rates in the 1990s in Bangladesh aimed to rationalize the structure towards a more simple and transparent system of customs tariffs and to encourage imports of agricultural inputs. In addition exchange rate liberation prompted exports growing from 3 percent of GDP in 1975 to 12 percent of GDP by 2000. The GDP-trade ratio itself increased from 11 percent in 1975 to 17 percent in 1990 to 30 percent in 2000 (BBS 1990-2009).

There were large and clear savings for the state from withdrawing subsidies. In 1981, the subsidies on fertilizers and irrigation cost 15% of all tax revenues. As of 2008, total subsidies are 8% of revenue expenditure as a percentage of GDP. Government revenue as a percentage of GDP increased from an average of 8.5 percent in the mid-1980s to 12 percent in 1995/96 (Ahmed and Haggblade 2000).

In terms of agricultural reforms the determining success factor was that the farmers and input dealers responded positively to the liberalization process. According to
Figure 17, the use of nitrogenous fertilizer increased drastically from the early 1980s. At the same time the use of pumps and tubewells rose to a point where the use of ground water irrigation surpassed that of the area under surface irrigation, thanks to liberalizing the trade market-- Figure 18.
The use of fertilizers and irrigation pumps in combination allowed for greater rice yield using hybrid seeds (boro crop), and greater rice production due to extra cropping in the winter with the help of irrigation. Rice production expanded during the 1980s and 1990s well ahead of population growth till the 2000s where although still not self-sufficient, it was much closer than it ever was in the past decades – Figure 19.
Table 9: Food Grain Production and Requirement 1975 to 2010

<table>
<thead>
<tr>
<th>Year</th>
<th>Food grain Requirement</th>
<th>Production</th>
<th>Import/Donation (Rice/Wheat)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Rice</td>
<td>Wheat</td>
</tr>
<tr>
<td>1974-75</td>
<td>12,914</td>
<td>11,109</td>
<td>115</td>
</tr>
<tr>
<td>1979-80</td>
<td>14,503</td>
<td>12,539</td>
<td>827</td>
</tr>
<tr>
<td>1984-85</td>
<td>16,242</td>
<td>14,622</td>
<td>1,483</td>
</tr>
<tr>
<td>1989-90</td>
<td>18,030</td>
<td>17,710</td>
<td>890</td>
</tr>
<tr>
<td>1994-95</td>
<td>19,702</td>
<td>16,833</td>
<td>1,245</td>
</tr>
<tr>
<td>1999-00</td>
<td>21,489</td>
<td>23,067</td>
<td>1,840</td>
</tr>
<tr>
<td>2004-05</td>
<td>22,855</td>
<td>25,156</td>
<td>976</td>
</tr>
<tr>
<td>2009/10</td>
<td>24,520</td>
<td>31,975</td>
<td>901</td>
</tr>
</tbody>
</table>

Source: Bangladesh Bureau of Statistics, Statistical Yearbook, various issues
According to Figure 20, rice production soared around 1995 with some increases in wheat and maize. Since maize is now deemed more profitable than wheat in terms of productivity and use as agricultural feed, wheat is slowly being replaced by maize. Although pressure on rice as a food source has increased, it seems to be coping up with the food requirement quite impressively – Table 9 and Figure 21. The country is almost self-sufficient and only importing food grains when there is shortage, which is a small percent of the total production.

**Figure 20: Production of Rice, Wheat and Maize, 1974/75-2009/10**

![Figure 20: Production of Rice, Wheat and Maize, 1974/75-2009/10](source)

Source: Bangladesh Bureau of Statistics, Statistical Yearbook, various issues

**Figure 21: Food Grain Requirement, Net Grain Production and Food Grain Imports, 1974/75-2009/10**

![Figure 21: Food Grain Requirement, Net Grain Production and Food Grain Imports, 1974/75-2009/10](source)

Source: Bangladesh Bureau of Statistics, Statistical Yearbook, various issues
Perhaps the most significant effect of reform was realized in the case of irrigation equipment and the drastic increase in its use. By early 1989 the cost of a shallow tubewell (complete with sinking, pipe, pump, and engine) to irrigate four to five hectares of land had fallen below taka 20,000 (US$600), which is about 60 percent of the subsidized price for such equipment through BADC. As a result, between 1988 and 1996 irrigated area expanded at a rate roughly twice as quickly as had been achieved between 1978 and 1986.

As mentioned earlier the use of shallow irrigation machines brought to Bangladesh for irrigation and other agricultural purposes extended way beyond agricultural purposes into non-agricultural ones. In addition to transforming cultivation in rural areas especially during winter, these handy engines started being used in a huge array of ways. They were being used to power simple rickshaws, and ‘van garis’, in addition to acting as motor power to small boats. Their use as backup generators in coastal regions and islands especially is also quite popular. The great spill-over effect on overall rural economy and development due to the rural engine has to credited mainly to the ingenuity and innovation of the Bangladeshi people, but it would not had happened had import policies not been reformed encouraging their uses.

In addition to impacting the use of fertilizers, the liberalization process also affected the state subsidy policies regarding fertilizers. The issues direct subsidized distribution of fertilizers was facing were (i) diversion of budget resources away from potential investments towards subsidies; (ii) distortion in the use of fertilizers and (iii) distraction of extension agents who spend large amounts of time monitoring the distribution process, at the expense of technical work. Liberalizing the distribution process of fertilizers helped directly influence agricultural production due to changes in input use and indirectly influenced agricultural and non-agricultural production by reducing or eliminating input subsidies. These savings can and it was believed did, lower budget deficits and affect the price of foreign exchange, which in turn influenced production of tradable agricultural products (Ahmed 2000).

Although the reforms of the 1980s and 1990s can be termed a success story, it would be fallacious to say however that the story was not without its glitches. Although not immediate, adverse effects of the reform process slowly surfaced and implications are still being struggled with today. The introduction of the HYV paddy meant more production, but it also meant more use of inputs was needed and it was more susceptible to natural disasters like flood. This meant marginal farmers were more vulnerable because of their limited resources in terms of investing in inputs and ability to cope with production losses due to natural disasters (Chowdhury and Uddin 2000).
Hybrid seeds were introduced in Bangladesh by NGOs like BRAC following the 1998 flood. However results were unsatisfactory since the hybrid seed is prone to diseases and yield is lower than HYV rice. Hybrid rice is also much more expensive than indigenous high yielding variety. A kilogram of imported hybrid seed costs around 200 taka (about 3 US dollars), whereas and equivalent amount of traditional high yielding rice costs Taka 25 (less than 0.4 US dollars) yet its use is constantly being encouraged by the government and institutions such as BRAC. Private companies are also earning huge profits due to the absence of proper government supervision. The government emphasizes more on yield rather than quality and does not properly certify the seeds as claims. Private companies also cheat farmers by selling them inbreed rice varieties but claim them as hybrids (Chowdhury and Uddin 2000).

Another concern is the over usage of fertilizer on cultivated land and its effect on the soil fertility. According to a recent article in the Wall Street Journal (February 2010 India), the fertilizers popularized by the green revolution during the 1970s and 1980s (as in Bangladesh) helped boost crop yields and transformed India into a nation that could feed itself. However urea, one of the main components of this heavily subsidized fertilizer is proving to significantly degrading farmland. Crops are falling and import levels are rising. Food prices in India have risen by 19% since 2009. India now produces less rice per hectare than its far poorer neighbors: Pakistan, Sri Lanka and Bangladesh. It is only a matter of time till the same story is told for Bangladesh also.
There were three main reasons for reform. One, the cost of public subsidies and transfers was proving to be expensive and there was a growing concern of the ineffective and inept capabilities of public policies and interventions (Cabral 2006). Two, donor and aid agencies such as the World Bank and USAID pushed for change in policies and three, the 1990s witnessed a fall in foreign aid altogether all of which finally put a closure to costly public programs (Cabral 2006). Reform happened in a series of stages which made the risks smaller, the task less daunting and positive results measurable acting a green light to continue the process. Much of its success can be attributed to luck and policy makers making decisions at the right time.

Due to surging oil prices, prices in diesel and fertilizer were costly internationally making it difficult to the government in Bangladesh to maintain subsidy costs. However, when the price of oil came down in the 1980s, cuts in subsidies for fertilizers did not affect prices, which in fact fell in the domestic markets. In addition, the falling diesel prices complemented the reforms making irrigation equipment more available and hence cheaper (Cabral 2006). During that time, prices in rice also fell which could have cost the farmers dearly had the input prices not fallen sharply from 1979 to 1980 – Figure 22 and Figure 23. Inputs prices had come down due to fall in international prices and to its more efficient distribution and reduced marketing margins (Cabral 2006).

**Figure 22: Relative Prices of Rice to Fertilizer in Bangladesh, late 1970s- early 1990s**

![Figure 22: Relative Prices of Rice to Fertilizer in Bangladesh, late 1970s- early 1990s](image)

As Figure 23 portrays, diesel prices after a peak in 1982, started to decline consistently and therefore so did the fertilizer prices. Due to the decrease in price of diesel and fertilizer, the price of rice also experienced a steady decline.

To the credit of the reformers, they recognized that the falling prices in irrigation equipment could be a great opportunity to save money on the costs of the equipment if markets were liberalized and standardization restrictions were removed. Even without subsidiaries the prices of the equipment had fallen well below what was available before by the state (Cabral 2006).

In the late 1980s and early 1990s, NGOs such as the Bangladesh Rural Development Centre (BRAC) and research groups such as the IFPRI team from the Ministry of Food (Babu 2000 cited in Cabral 2006 and IFPRI 1985) published reports where they were able to quantify losses of the government in distribution and regulatory programs. The extent of the losses made so dramatically clear caused a stir within the public, donor agencies and concerned state departments and further contributed to the policy reform process already taking place from the late 1970s.

By the 1990s foreign food aid to Bangladesh started to decline. Fortunately by that time Bangladesh had already increased food production due to winter cultivation of irrigated rice.
(Boro crop). According to Ahmed (1995), Bangladesh was producing 20% to 32% more rice by 1992 than it would have, had the reforms not taken place.

It is important to understand that the reform process went through different stages and did not happen in one magic step. Markets were liberalized slowly in stages enabling this process of liberalization to be easier to manage. As a result, success could be clearly identified and quantified before larger measures were taken. It was also easier to identify what decisions would result in bigger gains. For example, inefficient public distribution of inputs especially at the retail level was a bigger loss than wholesale and import and export functions of the BADC. Therefore relinquishing control on retailers would be the first step to take than the latter where the losses were less.
Arguably the biggest catalytic factor to the success of Bangladesh’s liberalization process was phasing the reforms in stages. Starting with simpler things, document success and then tackle the more difficult tasks all the while having strong monitoring and evaluation. Once a new problem presents itself, dealing with it immediately prevents negative impacts to pile up. To the credit of the reformers, they timed the reforms very well taking advantages of changes in global prices, market economies and trade policies which helped compound the positive effects of the reform and cushion the drawbacks of it.

For example, lifting subsidies for agricultural inputs may have had a harrowing effect on the farmers. It was already getting too costly for the government and cross-border illegal trade was being encouraged with the low prices of fertilizer (Indian farmers were getting cheap inputs paid by Bangladesh’s tax payers money). Subsidies are hard to sustain especially if they depend on foreign aid. Due to the fall in global diesel prices, new prices of agricultural inputs like fertilizer did not rise greatly after subsidies were removed. This coupled with allowing private stakeholders in the production and distribution process seemed to have impacted the farmers in a positive way.

It is important to remember, as was with the fertilizer story that competition and not an oligopoly was a good substitute for government monopoly. Government controlling prices means demand and supply curves are not taking natural courses and can affect farmers and consumers, while controlling production and distribution can prove inefficient, ineffective and espousing corruption. However shifting to an oligopolistic model has the potential of being more harmful with benefits being reaped in the hand of a few, often characterized by collusive behavior and rent seeking activities.

Subsidies are not always easy to withdraw especially if they are politically inclined as is the case in Bangladesh. Research and work done by private organizations and NGOs on the cost of existing policies is important to assess and can instigate changes by the government and political parties. Donor pressure, a politically sensitive paradigm, can be effective if they can deflect criticism from domestic reformers.

The Bangladesh experience portrayed that a limited role of the government seemed to have the most positive impact on the economy. The role of the government should be limited to policy reforms, and public and semi-public goods such as agricultural extension or infrastructural improvements. Agricultural extension systems have existed since independence and have been a great support to farmers in regard to seeding and cropping techniques, use of
hybrids, access to resources, markets and input channels. Liberalizing policies would not have had its paramount effect had the government not also contributed significantly during that time in improving the infrastructure of the country. Rural electrification, roads, and of late cell phones contribute to better allocation of resources. It has also help increase competition in the economy.

Many state run distribution channels like BADC although dismantled had a positive trickle-down effect. Experienced BADC personnel joined the private sector and became entrepreneurs in the agri-business sector. Having experienced and seen firsthand the difficulties faced by BADC these entrepreneurs were much better equipped to handle the shift to privatization and open markets.

The long term effect of privatization has resulted in much positive impacts along the length and width of the economy of Bangladesh. There is more diversification in different sectors such as agriculture, less reliance on the government and much unintended positive effects of reforms (such as the multiple uses of the diesel engine). It is import to continue the evaluation of these policy changes however so to ensure these impacts are not short lived and do have greater, not so positive implication in the future.
Bibliography


17. Key respondents interviewed included academics and researchers, senior staff of development partners, and retired BADC officials during August – September 2011.