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FERTILIZER MARKETING IN
BANGLADESH: TOWARD PRIVATIZATION

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Fertilizer Marketing In Bangladesh: Toward Privatization

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Increasing the use of fertilizer has been correctly seen as a key element, first by the Government of East Pakistan and since liberation by the Bangladesh Government (BDG), in the process of modernization for agriculture. Since Independence, the BDG has intervened at all stages in the production and distribution of fertilizer. All fertilizer production occurs in four BDG operated factories. Regional storage is handled by about 800 government managed warehouses. In the interest of widespread and equitable distribution of fertilizer, the totality of the distribution function has been controlled by the Bangladesh Agricultural Development Corporation (BADC). Since 1978 however, a process has been in motion that is slowly and increasingly shifting the responsibility for fertilizer marketing to the private sector. A number of factors interact to promote this transformation. In this paper, we will review some of the salient features of Bangladesh's agriculture, particularly the foodgrain sector, as a backdrop to describing the still evolving transition from public to private sector distribution of fertilizer. Special focus is given to several inputs which form a complementary package of significance to the use of fertilizer.

Bangladesh Agriculture

Bangladesh is roughly the size of Wisconsin, has a population of about 92 million people, with about 86 percent of its population living in

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rural areas. Most of them are poor (table 1). Virtually all of its productive land (22 million acres) is being cultivated at a cropping intensity of about 155 percent. Cereals dominate land use, accounting for about 82 percent of the cropped acreage. Annual rice cultivation covers about 25.5 million acres and wheat an estimated 1.5 million acres.^{1/} Foodgrain production in FY 83 is estimated to be in the neighborhood of 15.3 million tons which will be a record harvest. Despite growth in foodgrain output, total production has been insufficient to meet minimal domestic needs each year since Independence. In more recent years, shortfalls between 0.8 and 1.9 million tons have existed.

The country is frequently plagued by natural disasters arising from floods, drought, or cyclones. Given the relatively rapid population growth rates (estimated at 2.5 percent per annum) the efforts necessary to assure a reasonable level of food security are formidable.

Nevertheless, Bangladesh is not the "basket case" some would believe. The underlying agricultural resource base is excellent. The country is blessed with a year around cropping potential, excellent soils, easily available water for irrigation, and farmers who have demonstrated a willingness to adopt modern technology.

Increasing land use intensity and productivity is the only way Bangladesh will meet its food requirements. Increasing the use of fertilizer will be an important component in meeting this objective.

Foodgrain Production

Because foodgrains dominate Bangladesh's agricultural sector and account for most of the fertilizer use, this paper will concentrate on foodgrains. It is recognized that fertilizer is used extensively for potatoes

and tobacco, and to some extent for jute, sugarcane, tea and mustard. But, the acreage of these crops is limited by comparison and the amount of fertilizer used is relatively modest. Rice totally dominates the production of foodgrains in Bangladesh (Table 2). Currently, about 92 percent of total foodgrain production comes from rice. This represents a relative decline in the importance of rice in that until the 1960s it was virtually the only foodgrain produced in Bangladesh. Since about 1975, the increase in wheat production has been dramatic with current output amounting to about 1.2 million long tons. Bangladesh has three distinct rice crops, aus, aman and boro. The aman crop is by far the largest crop (about 60 percent of production) and aus has historically been the second largest. With the rapid expansion of irrigation the last two years, however, the boro crop in 1982/83 will produce about 28 percent of total rice production and aus production will be reduced to about 18 percent. During the period 1960/61 - 1982/83 aman aus and boro production has increased by 14, 20 and 1000 percent respectively. Wheat production has increased by forty times although most of the growth has occurred since 1975. Wheat represents only about eight percent of the total foodgrain production.^{2/}

Farm Size/Land Tenure:

Land holdings in Bangladesh are small. Roughly 50 percent of all holdings are under 2.5 acres. The average farm size of this group is 1.32 acres which is commonly fragmented into as many as five separate plots. The Gini coefficient for land distribution has been estimated at .675 ^{3/}. The Land Occupancy Survey of 1978 estimated that 4 percent of the households owned 32 percent of the land (Table 3). At the other extreme, 45 percent of the smallest households owned only eight percent of the land.

The Land Occupancy Survey also estimated that owner-operated holdings accounted for about 65 percent of total holdings, owner-cum-tenant holdings amounted to 28 percent, and tenant holdings accounted for the other 7 percent. About 24 percent of the land area was cultivated under tenant arrangements^{4/}.

There are no time series data on changes in land holdings or farm size over the period covered in this paper. However, there is considerable controversy concerning the impact of the dynamics of land tenancy in Bangladesh on overall land concentration. Some argue that rapid modernization coupled with Islamic inheritance laws has lessened further concentration of ownership by increasing land fragmentation. Others argue that at a critical minimum acreage, small farmers can not survive economic stress, and are forced to sell mostly to larger land holders, thus increasing land concentration. At the same time the larger landowning families, through the subdivisions associated with Islamic inheritance laws, are also having their land fragmented. The argument contends that changes in the overall distribution of landholding are uncertain, but there is a reasonable likelihood that average farm sizes are remaining essentially the same in response to these compensating influences. There is a lot of speculation, but little empirical evidence as to the effects of land tenure dynamics in Bangladesh.

Fertilizer Use:

Fertilizer was first introduced to Bangladesh in 1950. Consumption that year was about 2700 tons and virtually all was ammonium sulfate for tea production. By 1960, consumption reached about 50,000 tons. From 1960 to 1982, fertilizer sales have grown at an average about 15.5 percent per annum (Table 4). Acceleration of fertilizer sales began in the mid 1960s with the introduction of fertilizer responsive high yielding varieties (HYVs)

of paddy in consort with pump irrigation. The liberation war, floods, a breakdown of the Ghorasal urea factory in 1974, and the droughts in 1971/72, 1973/74, 1974/75 and 1981/82 represent a composite of factors responsible for periodic downturns in what is otherwise an impressive record of annual growth in fertilizer sales.

By 1982/83, average fertilizer use was about 61 lbs. per cultivated acre. There are no time series that would give a dynamic picture of changing use of fertilizer by farmers. However, starting in 1979 the International Fertilizer Development Center (IFDC) in collaboration with the Bangladesh Agricultural Research Council (BARC) has been carrying out an "Agriculture Production, Fertilizer Use, and Equity Considerations" study which has been looking indepth at fertilizer use by farmers. The purpose was to study the incidence and intensity of fertilizer use and the benefits of that use among groups of farmers (by land holding and tenure status). The study covered 1,850 farms in 16 districts. While the study is still in process, the initial report covers the boro crop of 1979/80 and the 1980/81 aus and aman crops.^{5/}

The study clearly indicates that most farmers use some fertilizer. Of the farmers surveyed 68, 62, and 61 percent used fertilizer on the boro, aus, and aman crops, respectively. Large farmers used slightly more fertilizer than small farmers (those under 2.5 acres), but small farmers tended to use more fertilizer per acre. The average use by farmers who used fertilizer for the boro, aus, and aman was 144, 93 and 107 lbs. per acre, respectively. Net returns to fertilizer varied by crop. For example, the average net returns for the 1979/80 boro crop was 288 Taka per acre where HYVs were used, but only 50 Taka for local boro varieties. Returns to fertilizer per acre also varied across farm sizes. For the 1979/80 boro crop, those farmers

with 1 acre or less averaged a net return of 150 Taka per acre. On the other hand those farmers with 5 acres or more averaged a net return for the same crop of only Taka 134 per acre. These returns represent benefit/cost ratios of just over 2.0 for both classes of farmers.

Research and the Use of HYVs:

Agricultural research in Bangladesh goes back to the early 1900s. However, the contemporary agricultural system, led by the Bangladesh Agricultural Research Council, is only a decade old, i.e. it began shortly after the war of 1971. The system has been able to successfully tap into the international agricultural research centers for germplasm and research innovations as well as training and advisory assistance. Consequently, the returns to investments in agricultural research have been impressive, particularly for rice and wheat.^{6/} Beyond foodgrain successes, the research system has produced HYV mustard and pulse varieties that have had very rapid farmer acceptance.

The "green revolution" technology arrived in Bangladesh in early 1966 with the introduction of IR-8 which was particularly suited for the boro season. By 1970, HYVs accounted for 26 percent of all boro acreage.^{7/} The Bangladesh Rice Research Institute (BRRI) was opened in 1969 and has subsequently released about 12 new HYV rice varieties based on domestic selections.

Today, about 25 percent of all rice acreage is under varieties released by BRRI and account for about 40 percent of all rice production. The HYV varieties have been particularly suitable for the boro season in consort with fertilizer and irrigation. At present, about 77 percent of boro acreage is

under HYV cultivation. Varietal development for the aus and aman seasons has been more difficult in part because of less favorable solar conditions and water control problems. HYV aman and aus varieties account for only about 16 percent of total acreage although they produce about 28 percent of these two crops.^{8/}

The new wheat varieties have virtually replaced local varieties since 1975. About 97 percent of Bangladesh's wheat acreage is now planted to improved varieties. HYVs were initially introduced from materials brought from India, Mexico, and the U.S.A. However, the expansion in production was led by BALAKA and DOEL varieties which were developed at the Bangladesh Agricultural Research Institute and released in 1979. From a stable base of around 150,000 acres of wheat in the 1960s, HYV wheat cultivation has increased dramatically to nearly 1.5 million acres which produced about 1.2 million tons in 1982/83.

Tables 5, 6, and 7 show the relative importance of the improved rice varieties.

Irrigation:

Historically Bangladesh has not had a significant amount of land under irrigation despite the prominence of rice. Cultivation of rice has been possible by a normally generous monsoon season which allowed the capture of sufficient water to mature the rice crop. However, the future of agricultural production, and particularly foodgrains, will largely be dependent on expanding irrigated acreage since irrigation is critical to assuring the responsiveness of HYVs and fertilizer.

Traditionally where lifts were only 2-3 feet and water was easily available, indigenous methods like the "swing basket" and "don" have been used for irrigation. Perhaps as much as a 1.6 million acres are still being

irrigated in this manner. With modern irrigation methods, HYVs, and complementary inputs, larger amounts of land can economically be brought under more intensive use. The Second Five Year Plan envisions over seven million acres under irrigation by 1984/85.^{9/} While unlikely to be achieved, the projection still represents only about half of the potential irrigated acreage. Since the early 1960s, modern irrigation methods including low lift pumps, shallow and deep tubewells, hand pumps, and gravity systems have been introduced to Bangladesh. By 1982/83 about 3.6 million acres were under modern irrigation methods.^{10/} With the increased emphasis on privatization of pump sales since 1981, there has been an extremely rapid increase in the number of shallow tubewell sales as well as more modest sales of low lift pumps and deep tubewells. It is estimated that the total acreage under modern irrigation methods may have increased by about 956,000 acres over the last two years alone. Table 8 illustrates the increase in modern irrigation coverage since 1960/61.

Agricultural Credit:

Traditionally the most important source of credit for farmers has been large landowners, village businessmen, friends, and family. Estimates vary, but about 60-80 percent of all farmer financing comes from these sources. Interest on loans from these sources vary up to 200 percent annually, but usually it is not less than 50 percent. These sources are flexible and convenient and still represent the most important means of financing for farmers. The high interest rates, however, make investments in modern inputs less economic and more risky.

Before Independence formal credit for agricultural production (mostly for fertilizer and irrigation equipment) was largely through the Krishi (Agricultural) Bank, the Government Taccavi system, and Cooperatives. Since

Independence and the nationalization of commercial banks, the Central Bank has encouraged expanded disbursement of credit to the agricultural sector. Table 9 contains a time series estimate of loans disbursed to agriculture since 1960. Information is not available as to the exact use that was made of the credit. For more recent years (since 1976/77), the disbursements are reported by categories. Of particular interest is the "short term" loans which were primarily used for fertilizer, but also for other variable costs such as seed, labor and irrigation (Table 10). Over the period since 1976, about 57 percent, or 8,219 million Taka were made available for short term agricultural credit from BDG institutional sources.

While the amount disbursed is not inconsequential, most small farmers do not have access to institutional credit. The small farmers in general view bank credit as for "someone else." They also fear putting their land up as collateral. Tenants obviously are excluded for lack of land. Potential credit customers find that transaction costs of obtaining a loan are high and are unwilling to pay the unofficial fees to get a loan. Furthermore, they resist putting up with the long lead time it takes to obtain a loan (often weeks and sometimes months).^{11/} Overall, institutional credit is not meeting the needs of the agricultural sector. For example, in 1982, agricultural credit disbursements from formal sources were only 4.4 percent of the value of agricultural production. By comparison, the figure for the Philippines is 20 percent.^{12/}

Agricultural Extension:

Bringing modern farming practices to over 12 million farm families is the responsibility of the extension service. Since liberation, the extension function has been fragmented so that by the late 1970s the Department of Extension and Management (DEM) was only one of about twenty institutions

which had some type of extension responsibilities. Most are research institutes which are organized along commodity lines, e.g. jute, cotton, etc., but which have outreach responsibility although, DEM has had the largest institutional capacity. By 1979/80 roughly nine thousand positions were sanctioned although only about 5500 staff were actually on board. DEM's officers are posted at the union, thana, sub-division, district, division, and national levels.

In 1981/82 the various extension functions have been reconciliated into one service now called the Directorate of Agriculture Extension. The aim of this is to make multi-disciplinary/multi-crop expertise more readily available to farmers. In addition, the BDG has been experimenting with the Training and Visitation (T&V) system in the Rajshahi Division and may expand this approach nationwide.

The rather large extension system described above, however, is not very effective. Recent analysis by an ADC associate revealed the very limited contact the extension services have had with farmers.^{13/} The staff, albeit large in numbers, still represents only 1 village level worker per 2000 or so families. More importantly, it appears that the poorly motivated and generally ineffectual extension agents at the village level result from poor training, poor salaries, and limited career prospects.

Foodgrain Marketing:

Thousands of itinerant traders, either Beparies or Farias, are responsible for moving grain from the farm gate into the formal market system. These traders are highly competitive, handle small lots of grain with poor transport infrastructure, and survive on surprising small margins of profit. From the village level, foodgrains move into one of the estimated 6500 village level primary markets. The next level of marketing is to about 450 "towns". Terminal markets in the larger cities serve the big urban clusters like Dhaka, Chittagong, and Khulna.^{14/}

Depending on the crop year, it is estimated that 17 - 22 percent of foodgrain production is "marketable" surplus.^{15/} Over the last few years this would be from 2.5 to 3.3 million long tons. Aggregate figures can be somewhat misleading, however, in that the small farmers often both sell foodgrains for cash requirements early in the season and later buy back grain.

The BDG's Ministry of Food (MOF) is the nation's largest grain merchant. Its principal responsibility is to supply the Public Food Distribution System (PFDS) with grain for distribution to ration card holders who, for the most part, are urban dwellers and government servants. The grain is distributed at concessionary rates. Since 1978/79, the MOF has tried to utilize domestic procurement of rice and wheat as an incentive price mechanism to encourage production. In actuality the BDG's procurement program has been operated more as a floor price. The program does not appear to be effective in providing a stable planning horizon for farmers which would encourage a higher level of HYV technology utilization and greater output. Field visits confirm that most farmers do not know the procurement price, and, if they do, generally they are unwilling to accept the procurement center's issue of script for later cash redemption at a bank. In any case, the official procurement prices have been relatively low in relation to domestic market prices and, consequently, the system has never procured much grain, with one exception. In 1980/81, a bumper aman crop year, the BDG purchased 1 million tons. That amount represented 6.8 percent of the total foodgrain crop in that year and, to some extent, the intervention of the BDG may have kept prices to the producers higher than might otherwise have been the case.

The PFDS is probably more important to producers due to its dampening impact on farm gate prices. The marketing of from 1.5 to 2.6 million tons of foodgrains annually through the PFDS at subsidized prices eliminates this

demand from regular market channels. In 1981/82, PFDS ration offtakes to other than "Food for Work" or "Vulnerable Groups" totaled 761,000 and 887,000 long tons of rice and wheat, respectively. Using average annual ration issue price and average coarse rice and wheat prices, the estimated subsidy in the ration system that year was roughly Taka 1.3 billion (about \$59 million). This does not include the Ministry of Food costs for handling storage, losses, and distribution which are not known exactly, but are estimated to be in the neighborhood of \$5 million. Using 1981/82 international c.i.f. prices, the implied subsidy would be more in the order of Taka 2.5 billion (\$ 112 million) excluding BDG costs. These subsidies come to 15 percent and 28 percent, respectively, of the 1981/82 Annual Development Plan budget allocated for agriculture.

Food aid, which has supplied 1-2 million tons depending on the year, is by far the most important source of grain for the PFDS and as such makes it easier for the government to continue a low foodgrain price policy for ration recipients. While the country is foodgrain deficit, the way in which food aid is distributed by the government does appear to contradict its other long-term agricultural developmental objectives through the price dampening effect the ration system must have on output prices. On the other hand, higher food prices most acutely affect urban dwellers who are also the most politically vocal. Also, sales of donor foodgrains through the PFDS provide funds for the national budget. The BDG has a difficult price policy tightrope to walk. Table 11 presents production, procurement, and PFDS offtakes for 1972/73 through 1981/82.

In summary, the changes in Bangladesh's foodgrain sector, particularly since 1976/77, are impressive. Modernization can and is taking place. Foodgrain production, has grown since 1960/61 at a rate of about 2.1 percent

but has shown an acceleration since 1973/74 to about 3.2 percent per year. These trends are not unimpressive considering historical growth rates in the agricultural sectors of many other countries. Figure 1 highlights some of the important changes associated with foodgrain production since 1960. Nevertheless as Table 12 shows, Bangladesh still has not met its own food-grain requirements and in the background is the relentless growth of population at a rate of about 2.5 percent per annum.

The Evolution from Public Sector to Private Sector
Distribution and Marketing of Fertilizers: 16/

Prior to 1960/61 fertilizer production and marketing were carried out by a number of arrangements between tea estates, the Fenchuganj Fertilizer Factory, foreign suppliers, and the Directorate of Agriculture. In 1961/62 the East Pakistan Agricultural Development Corporation - now BADC - was organized and given total responsibility for the distribution of fertilizer. With Independence, BADC continued to have sole jurisdiction for fertilizer marketing.

Since the mid-1970s, Bangladesh's fertilizer marketing system has been evolving by stages in the direction of allowing the private sector to take more and more responsibility. Under the Old Marketing System (OMS), pre-1978, BADC sold fertilizer at over 400 Thana Sales Centers (TSCs) with a tightly controlled system of distribution. Since 1978, a New Marketing System (NMS) has developed, allowing BADC to retrench by distributing fertilizer through about 90 Primary Distribution Points (PDPs). Licensing of limited fertilizer dealerships has given way to unrestricted competition among wholesalers and dealers who are free to transport and sell fertilizer wherever farmer demand leads.

The OMS went through several changes before emerging as the NMS. In 1962, the EPADC, the predecessor of BADC, assumed the responsibility for marketing agricultural inputs, with the exception of ammonium sulfate and pesticides. It developed a fertilizer distribution system which involved making fertilizer available through appointed retail dealers at the thana level. BADC operated 423 TSCs at which fertilizer products were sold to selected retail dealers who, in turn, sold to the farmers. Under the OMS, approximately seventy five percent of the fertilizer has been sold by BADC directly to private dealers. The remainder was distributed through Thana Central Cooperative Associations (TCCAs) which were designated as wholesalers and resold it to private dealers and to member village cooperatives, Krisho Samabaya Samities. In 1962/63, the first full year of fertilizer distribution under the OMS, 47,000 tons of fertilizer were sold. By 1977/78, sales had risen to 715,000 tons under the OMS and to an estimated 925,000 tons in 1982/83 under the NMS.

Under the OMS, each dealer was appointed by BADC on the approval of a thana committee composed of BADC's thana inspector, the Ministry of Agriculture's thana extension officer, the local union council chairmen, and an officer representing the deputy commissioner at the thana level. On approval of the committee, a memorandum of agreement between the dealer and BADC was drawn up. Some of the dealer's conditions and restrictions were as follows:

- 1) his sales were limited to a specified area,
- 2) his commission and the retail price of fertilizer were set by the government,
- 3) he was allowed to lift fertilizer only from the TSC where he was registered and was sometimes required to buy various types (Urea, TSP, MP) of fertilizer products in fixed proportions, and
- 4) he was required to keep books, e.g. cash memo books, stock record book, sales register, available for inspection by BADC.

Fertilizer prices during the OMS years moved slowly but steadily upward to reflect world price increases and Bangladesh subsidy reductions. During this time, the dealer's gross commission was based on the distance of the dealer's shop from the TSC or the TCCA warehouse from which he was supplied. On the basis of a study prepared for BADC by IFDC's Distribution Consultant, BADC in 1977/78 paid dealers an average gross commission representing 8.6% of BADC's gross sales revenue. This low level of commission left little and sometimes no profit for the dealer after paying his transportation and handling costs. Dealers have revealed that, under the OMS, when handling and freight charges were excessive they raised the consumer price above the official price to avoid incurring a loss on their investment. The poor financial return from fertilizer sales caused most dealers to regard fertilizer as a marginal business activity. A lack of funds to invest in fertilizer and the poor profit incurred with which to generate new funds caused dealers to make frequent trips to purchase fertilizer in small quantities. Thus, under OMS, the responsibility for warehousing fertilizer remained almost entirely with BADC. With an estimated 22,000 active dealers in 1977/78, the sales per active dealer averaged 33 tons. Under the OMS, dealers had little knowledge of proper use of fertilizer, nor were they aware of current recommendations being made by agricultural extension officers. The promotion of fertilizer use by farmers rested solely with the Directorate of Agriculture (Extension and Management).

Now, under the NMS, BADC is still the sole importer of fertilizer and the sole distributor down to the sub-divisional (PDP) level. From the PDP level, wholesalers and dealers distribute all fertilizer. BADC adopted the NMS first in Chittagong Division, beginning January 1980, and it has now been implemented nationwide. The major reforms embodied in the NMS include:

- consolidation of BADC sales points to about 90 PDPs,
- open registration of dealers in place of the former restrictive licensing requirements,
- increased dealer profit margins at PDP's to encourage entry into the business and wider distribution,
- reduced prices on large purchases at PDPs to encourage wholesaling,
- unrestricted private movement of fertilizer anywhere in the country, except in the border areas,
- elimination of fertilizer "rationing", whereby dealers were sometimes required to buy various fertilizer products in fixed proportions,
- setting dealer prices for various imported fertilizer products in proportion to their costs to BADC,
- dealer training workshops which train dealers in the promotion of fertilizer use, sales and marketing,
- establishment of a dealers credit program to make credit available directly to the dealers, and
- decontrol of retail fertilizer prices first in the Chittagong Division and on April 1, 1983 for the entire country.

An IFDC evaluation of the NMS after the initial year of operation in the Chittagong Division found:

- farmers' access to fertilizer increased by 130 percent since the introduction of the NMS (measured in terms of retail sales points),
- prices farmers paid for fertilizers under the NMS were lower than those paid under the old system, and
- a new class of fertilizer wholesalers had developed, (44 percent of the active PDP dealers sold over 50 percent of their fertilizer stocks to sub-dealers.)

The most recent evaluation of the NMS, "Third Evaluation of the Bangladesh Agricultural Development Corporation Fertilizer New Marketing System", has found the following:

- the number of active dealers is declining while dealers are lifting on average twice the amount of fertilizer per BADC transaction,
- 87% of the current active registered dealers were also dealers in the OMS,
- over 40% of the dealers are selling to sub-dealers,
- 67% of the dealers reported significant sales increases the past year,
- fertilizer prices in remote areas are often higher than the official price and fertilizer prices close to PDP's are often lower than the official price, and
- fertilizer sales and availability have increased in the past year.

An advantage of the NMS is that supply follows demand. So local shortages are rare in dealers' shops as long as regional supplies are adequate. In addition, the newly emerging large wholesalers reduce BADC costs by (1) increasing dealer inventories and thus transferring some of the costs of storage to the private sector, (2) reducing the number of transactions that BADC makes, and (3) lessening the transport costs of BADC. It is important to note that the wholesale quantity discounts at PDPs do not prohibit lifting by small dealers. They are still able to purchase fertilizer at the normal price. However, the quantity discounts do encourage larger purchases and thereby result in the savings mentioned above. Finally, the decontrolling of fertilizer prices have allowed retail prices, under the competitive sales situation, to accurately reflect distribution costs. -Close to PDPs where transport costs are low, dealer competition has led to retail prices below

old official levels. With the price decontrolled, fertilizer should become more available to farmers in those most remote areas where previously dealers have been constrained by the degree to which they felt they could exceed government set retail prices.

The transition to the NMS has not been accomplished without trepidation. BADC feels weakened by its declining control over fertilizer marketing and has at times moved slowly in implementing some features of the NMS. Senior government leadership, continually barraged by local political interests plus maintaining a genuine belief that middlemen are exploitive, feel uncomfortable increasing the role of the private sector in distributing fertilizer.

The question then is why has the privatization of fertilizer marketing progressed as far as it has? There seems to be a number of interacting reasons. First, is the continued pressure felt by government leadership to close the gap between domestic foodgrain needs and production (Table 12) as well as to provide more productive employment opportunities and general economic growth. These objectives require a rapid expansion of the agriculture sector and in particular foodgrain production. The importance of fertilizer, in conjunction with HYV technology and irrigation to accomplish this, is widely recognized.

Bangladesh farmers, small and large, have demonstrated they are responsive to economic incentives and are not hesitant to invest in fertilizer if they can obtain it. Recognition that the private sector can be more effective than BADC in supplying fertilizer to points where farmers have convenient access, has been an important reason for increasing the role of private fertilizer dealers.^{17/}

Another important factor has been the realization by those concerned with national finances that the BADC fertilizer distribution system was becoming an increasingly unacceptable burden on the treasury. The fertilizer subsidy has risen quite consistently to the point where in 1982 it represented about 12-13 percent of the Annual Development Plan for agriculture. Given the pressures for increasing developmental investments across the board, e.g., roads, power, etc., the BDG has been pushed to look for ways to reduce subsidies. Passing the costs of fertilizer marketing on the users was a rational move to free government resources for other activities. A concomitant policy change has been to increase fertilizer prices in the interest of reducing the subsidy. In 1975/76, about 60 percent of the cost of fertilizer was subsidized. By 1981/82, the subsidy had been reduced to about 22 percent.

Third, and not inconsequential, has been the concerns of donors, who finance most of the BDG development budget, for increased efficiencies in development activities. Donors have been willing to substantially support the BDG (\$ 1,236 million was disbursed with a pipeline of \$ 3,842 million in 1981/82) and they have increasingly pressured for more cost-effective use of their support. The inefficiencies and costliness of the BADC fertilizer marketing system has been an obvious area for improvement. Donors too have felt that the private sector could be more efficient in marketing fertilizer and so, in discussions with the BDG, donors, particularly USAID and the World Bank, have attached particular importance to seeking ways to increase the involvement of the private sector in fertilizer distribution.

Fourth, the private sector has responded and has demonstrated a capability to handle the assignment. Perhaps 250,000 small scale retailers and an estimated 22,000 wholesalers are involved in the process. To date the change has been accomplished without evidence of collusion among sellers.

It is significant that the private sector has been able to distribute upwards of 850,000 tons of fertilizer in small lots, usually not more than 50 kilos per individual sale to the farmer.

The public sector fertilizer distribution and marketing system continues to be constrained by several factors:

- the tendency toward bloated personnel structure and inefficiency. (No tendency to be lean and efficient if profits are not a consideration). BADC has grown to 30,000 employees,
- limited sales promotion (no incentive to make profits),
- inefficient transport arrangements, and
- inability to adjust to immediate needs, e.g. special sales to reduce inventories, check regional spot shortage, etc.

The next step in the evolution of Bangladesh's fertilizer marketing system would be to allow wholesalers to distribute fertilizer from the ports and factories. By lengthening the supply line in which the private sector can carry out the marketing of fertilizer, opportunities should be increased for realizing the efficiencies that the private sector can bring about.

The evolution to private sector marketing has also involved a changing role for the BDG. The government's prior direct involvement in all aspects of marketing must give way to a regulatory role designed to insure the integrity of the market place. The new role is more accurately described as one of protection within which the BDG will be required to guarantee that such market functions as product quality and exchange are accomplished with honesty and in the model of open competition. These are new roles to the BDG after years of market intervention and control. If the NMS is to succeed, however, the efficiency of the market place must be demonstrated and maintained.

FOOTNOTES

- 1/ E. Boyd Wennergren, An Assessment of The Agricultural Sector in Bangladesh, (Dhaka: USAID) In Process.
- 2/ Wennergren, Agricultural Assessment, Chapter 3.
- 3/ Wayne Miller, "Changes in Agricultural Input Use and Foodgrain Self-Sufficiency - Agricultural Impact Evaluation". Mimeo Report, USAID/Dhaka, November, 1982.
- 4/ Tomasson Januzzi and James T. Peach, The Agrarian Structure of Bangladesh: An Impediment to Development. (Boulder: Westview Press), 1980.
- 5/ International Fertilizer Development Center, Agricultural Production, Fertilizer Use, and Equity Considerations, (Dhaka: BARC) April, 1982
- 6/ Gerard J. Gill, Operational Funding Constraints on Agricultural Research in Bangladesh. Bangladesh Agricultural Research Council, Report No.9, April, 1981.
- 7/ Bangladesh Bureau of Statistics, Agricultural Statistics Wing.
- 8/ Wennergren, Ibid.
- 9/ Ministry of Finance and Planning, Medium Term Food Production Plan, Vol. II (Project Portfolio), October, 1980.
- 10/ World Bank, Recent Economic Trends and Medium Term Developmental Issues, Report No. 4277-BD, March 4, 1983.
- 11/ Miller, Impact Evaluation.
- 12/ USAID, Rural Finance, Project Paper, (In process), April, 1983
- 13/ Gerard J. Gill, Pilot Survey of Farmers Sources of Information, Bangladesh Agricultural Development Council, Dhaka, November, 1982.
- 14/ Wennergren, Ibid.
- 15/ Raisuddin Ahmed, "Foodgrain Distribution Policies Within a Rural Pricing Mechanism: The Case of Bangladesh", Reprinted in Development Issues in An Agrarian Economy, Center for Administrative Studies, Dhaka, 1981.
- 16/ USAID Correspondence to Ministry of Agriculture by Carl Lawhead, USAID, October, 1982.
- 17/ Based on Personal Conversations by C. Antholt with BADC/MOA leadership during the period 1976-1979.

Figure 1 : Foodgrain Production, Irrigated Acreage, Fertilizer Sales and HYV Foodgrain Acreage 1960/61 to 1982/83

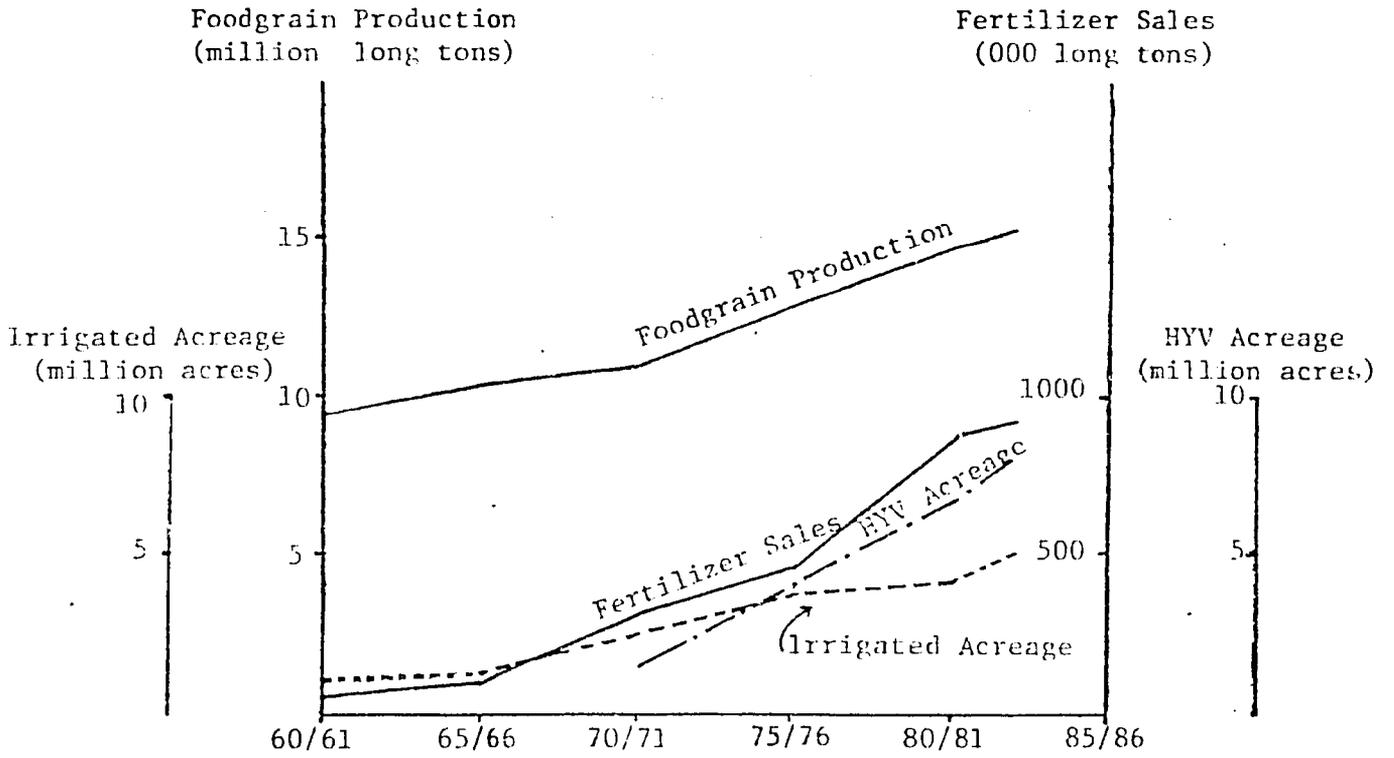


Table 1: Per Capita GDP at constant prices (1972/73) Takas

<u>Year</u>	<u>Takas</u>
1969/70	732
1970/71	678
1971/72	582
1972/73	612
1973/74	651
1974/75	661
1975/76	693
1976/77	688
1977/78	724
1978/79	736
1979/80	738
1980/81	770

Source: (1) Economic Indicator of Bangladesh
May 1982, No.5
(2) World Bank Report No.1038-BD.
March 22, 1976

Table 2: Foodgrain Production 1960/61 to 1982/83
(000 million long tons)

<u>Year</u>	<u>Rice</u>	<u>Wheat</u>	<u>All Grains</u>
1960/61	9.5	.03	9.5
1961/62	9.5	.04	9.5
1962/63	8.7	.04	8.7
1963/64	10.5	.03	10.5
1964/65	10.3	.03	10.3
1965/66	10.3	.04	10.3
1966/67	9.4	.05	9.5
1967/68	11.0	.06	11.1
1968/69	11.2	.09	11.3
1969/70	11.8	.10	11.9
1970/71	11.0	.11	11.1
1971/72	9.8	.11	9.9
1972/73	9.9	.09	10.0
1973/74	11.7	.11	11.8
1974/75	11.1	.12	11.2
1975/76	12.6	.22	12.8
1976/77	11.6	.26	11.9
1977/78	12.8	.34	13.1
1978/79	12.6	.50	13.1
1979/80	12.5	.81	13.3
1980/81	13.7	1.08	14.8
1981/82	13.4	.95	14.4
1982/83*	14.2	1.20	15.4

* USAID estimate April 1983

Source: BBS

Table 3: Size Distribution of Total Owned Land In Rural Bangladesh

<u>Number of Acres</u>	<u>Number of Households</u>	<u>Percent of Total</u>	<u>Number of Persons</u>	<u>Percent of Total</u>	<u>Area (Acres)</u>	<u>Percent of Total</u>
Zero	1,767,334	14.69	8,081,266	11.59	-	
0.01-1.00	5,375,887	44.68	27,561,648	39.54	1,733,223	8.33
1.01-2.0	1,830,170	15.21	10,821,861	15.53	2,660,128	12.78
2.01-3.00	1,045,072	8.69	6,706,826	9.62	2,556,850	12.28
3.01-4.00	621,105	5.16	4,438,188	6.37	2,141,713	10.29
4.01-5.00	370,799	3.08	2,811,716	4.03	1,651,046	7.93
5.01-6.00	253,414	2.11	2,027,653	2.91	1,375,463	6.61
6.01-7.00	173,661	1.44	1,520,481	2.18	1,123,908	5.40
7.01-8.00	110,825	0.92	963,593	1.38	827,971	3.98
8.01-9.00	94,944	0.79	835,505	1.20	803,505	3.86
9.01-10.00	66,979	0.56	581,056	0.83	636,690	3.06
10.01-11.00	60,764	0.51	568,972	0.82	634,253	3.05
11.01-12.00	38,668	0.32	378,394	0.54	444,388	2.14
12.01-13.00	36,251	0.30	358,024	0.51	451,674	2.17
13.01-14.00	25,894	0.22	276,200	0.40	350,779	1.69
14.01-15.00	19,679	0.16	215,091	0.31	285,006	1.37
Over 15.00	139,226	1.16	1,556,732	2.23	3,137,282	15.07
TOTALS	12,031,272	100.00	69,703,206	100.00	20,813,879	100.00

Source: Land Occupancy Survey of 1978

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Table 4: Fertilizers Sales 1960-61 to 1981-82

Year	Total Fertilizer Used (Tons)	Yearly Change (Tons)	Yearly Change (%)
1960-61	50,360		
1961-62	52,170	1,810	3.6
1962-63	47,629	-4,541	-8.7
1963-64	101,841	54,212	113.8
1964-65	93,641	-8,200	-8.1
1965-66	106,107	12,466	13.3
1966-67	161,962	55,855	52.6
1967-68	211,081	49,119	30.3
1968-69	225,308	14,227	6.7
1969-70	277,107	51,799	23.0
1970-71	304,370	27,263	9.8
1971-72	243,842	-60,528	-19.9
1972-73	384,323	140,481	57.6
1973-74	379,884	-4,439	-1.2
1974-75	279,569	-100,315	-26.4
1975-76	457,586	178,017	63.7
1976-77	512,586	55,000	12.0
1977-78	715,370	202,784	39.6
1978-79	741,600	26,230	3.7
1979-80	841,986	100,386	13.5
1980-81	874,639	32,653	3.9
1981-82	829,300	-45,339	-5.2
1982-83*	925,000	95,700	11.5

* Estimated by USAID

Source: Bangladesh Bureau of Statistics

Table 5 Aus: Relative Importance of HYVs

<u>Year</u>	<u>Production (Million Long Tons)</u>	<u>Percent of Production from HYVs</u>
1971/72	2.3	6
1972/73	2.3	7
1973/74	2.8	14
1974/75	2.9	24
1975/76	3.2	27
1976/77	3.0	28
1977/78	3.1	29
1978/79	3.3	29
1979/80	2.8	30
1980/81	3.2	33

Table 6 Boro: Relative Importance of HYVs

<u>Year</u>	<u>Production (Million Long Tons)</u>	<u>Percent of Production from HYVs</u>
1971/72	1.7	57
1972/73	2.1	64
1973/74	2.2	72
1974/75	2.3	70
1975/76	2.2	73
1976/77	1.7	76
1977/78	2.2	73
1978/79	1.9	79
1979/80	2.4	79
1980/81	2.6	77

Table 7 Aman: Relative Importance of HYVs

<u>Year</u>	<u>Production (Million Long Tons)</u>	<u>Percent of Production from HYVs</u>
1971/72	5.7	12
1972/73	5.6	18
1973/74	6.7	30
1974/75	6.0	17
1975/76	7.0	17
1976/77	6.9	13
1977/78	7.4	15
1978/79	7.4	20
1979/80	7.3	23
1980/81	7.8	26

Source: BBS

Table 8: Acreage Irrigation by Modern Methods 1960-1983 (000 Acres)

<u>Year</u>	<u>Gravity Schemes</u>	<u>DTWs</u>	<u>LLPs</u>	<u>STWs</u>	<u>Total</u>
1960/61			65		65
1961/62			74		74
1962/63			133		133
1963/64			156		156
1964/65			132		132
1965/66	17	6	179		202
1966/67	28	12	232		272
1967/68	51	45	330		426
1968/69	78	74	441		593
1969/70	82	94	653		829
1970/71	83	87	901		1071
1971/72	58	33	886		977
1972/73	64	74	1226	4	1368
1973/74	67	91	1337	4	1499
1974/75	67	141	1307	23	1538
1975/76	84	179	1329	15	1607
1976/77	92	179	1107	24	1402
1977/78	135	348	1351	94	2026
1978/79	157	514	1444	115	2230
1979/80	241	612	1514	166	2533
1980/81	303	653	1377	301	2634
1981/82	322	761	1311	549	2943
*1982/83	350	833	1467	940	3590

* USAID estimate April 1983

Source: BWDB
BADC
BKB

Table 9: Agricultural Loans Advanced 1960/61 to 1981/82 (million Taka)

<u>Year</u>	<u>Taka</u>
1960/61	99.6
1961/62	98.8
1962/63	105.0
1963/64	108.3
1964/65	97.9
1965/66	80.9
1966/67	99.8
1967/68	158.3
1968/69	195.4
1969/70	240.7
1970/71	144.3
1971/72	322.3
1972/73	239.0
1973/74	149.8
1974/75	N/A
1975/76	N/A
1976/77	1,060.3
1977/78	1,545.6
1978/79	1,719.9
1979/80	2,688.8
1980/81	3,467.2
1981/82	4,034.4

Source: Bangladesh Bank, BKB, BSB, NCB, MOA

Table 10: Short Term Agricultural Loan 1976/77 to 1981/82
(million Taka)

<u>Year</u>	<u>Taka</u>
1976/77	686.6
1977/78	1,085.4
1978/79	987.3
1979/80	1,354.3
1980/81	1,938.5
1981/82	2,166.8

Source: Bangladesh Bank, BKB, BSB and NCBs

Table 11: Foodgrain Production, Procurement and Ration Offtakes 1972/73 to 1981/82

(Million Long Tons)

<u>Year</u>	<u>Production</u>	<u>Procurement</u>	<u>Ration Offtakes</u>
1972/73	10.0	-	2.6
1973/74	11.8	.07	1.7
1974/75	11.2	.13	1.8
1975/76	12.7	.42	1.7
1976/77	11.8	.31	1.5
1977/78	13.1	.55	1.8
1978/79	13.5	.36	1.8
1979/80	13.3	.35	2.4
1980/81	14.7	1.02	1.5
1981/82	14.3	.30	2.0

Source: BBS

Table 12: Domestic Foodgrain Availabilities Versus Foodgrain Requirements 1972/73 to 1982/83 (million long tons)

<u>Year</u>	<u>Net Foodgrain Available from Production</u> *	<u>Foodgrain Requirements</u> **	<u>Gap</u>
1972/73	9.0	11.7	-2.7
1973/74	10.6	12.0	-1.4
1974/75	10.1	12.3	-2.2
1975/76	11.5	12.6	-1.1
1976/77	10.6	12.9	-2.3
1977/78	11.8	13.2	-1.4
1978/79	12.2	13.5	-1.3
1979/80	12.0	13.9	-1.9
1980/81	13.3	14.1	-0.8
1981/82	12.9	14.5	-1.9
1982/83***	13.9	14.8	-0.9

Source: Recent Economic Trends and Medium Term Development Issues, World Bank, March 1983.

* Foodgrain availabilities assumes 10 percent for seed and waste

** Foodgrain requirements are estimated at 15.5 oz per capita per day

*** USAID estimate April 1983