Fertilizer Distribution Improvement Project-II

Contract Number: 388-0060-HCC-8701-01

End of Project Report

March 1987 through August 1994

Submitted to

The Ministry of Agriculture of Bangladesh

and

The United States Agency for International Development

by

The International Fertilizer Development Center

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A Chronology of Significant Events during FDI-II

February, 1987	Host Country Cost Reimbursement Contract between BADC and IFDC signed
March, 1987	FDI-II implementation commences
March, 1987	A manual MIS for the fertilizer sector implemented
March, 1987	The policy of transportation discount points (TDP's) implemented
July, 1987	Private sector dealer development and training programs begin
September, 1988	The MIS for the fertilizer sector is computerized with local area network
December, 1988	Fertilizer technology transfer program begins with demonstration plots
March, 1989	Government policy changed to allow direct procurement of urea from factories by the private sector
March, 1989	50:50 quota system for public and private purchases introduced
March, 1989	A novation contract signed between BADC, IFDC and MOA to suostitute MOA as a party to the contract in place of BADC
April, 1989	An in-kind credit program for fertilizer dealers begins
June, 1989	Commercial credit program for private sector fertilizer dealers implemented
July, 1989	Public sector primary distribution points (PDP's) begin closing
July, 1989	Government policy changed to allow direct procurement of TSP and MP from factories and ports by the private sector
July, 1989	Transfer of BADC fertilizer warehouses begins
November, 1989	Farm-level fertilizer use studies commence
December, 1989	Government abolished the 50:50 quota system of BADC for procuring urea
July, 1990	Use of inland letters of credit for fertilizer procurement from factories begins
July, 1991	In-kind credit program abolished
July, 1991	Government policy changed to allow direct import of fertilizers by the private sector
August, 1991	Government policy changed to allow partial removal of subsidies on TSP and MP
November, 1991	Demonstration of hybrid maize cultivation in Bangladesh begins
February, 1992	Contract amended to extend FDI-II from April 1, 1992 to August 29, 1994
July, 1992	Private sector manages 100% of fertilizer imports
December, 1992	Government policy changed to discontinue public sector fertilizer distribution
December, 1992	Government policy changed to allow complete elimination of subsidies on TSP and MP
February, 1993	MIS computer hardware and software enhanced with a local area network
April, 1993	DAP sales promotion campaign begins
May, 1993	Strategic plan for urea pricing at BCIC factories submitted to BCIC
May, 1993	Assessment of the impact of fertilizer subsidy removal completed
June, 1993	Fertilizer imports at full cost by the private sector begin
June, 1993	Private sector begins to organize and finance training programs for fertilizer dealers
November, 1993	Bangladesh Fertilizer Association formed
April, 1994	Fertilizer control order submitted to MOA
July, 1994	An environmental assessment of BCIC ammonia-urea factories completed
July, 1994	Membership in Bangladesh Fertilizer Association exceeds 450
August, 1994	FDI-II closes

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ACRONYMS

ADB	Asian Development Bank
ALIGU	American Language Institute of Georgetown University
ASP	Ammonium Sulphate
ATDP	Agribusiness and Technology Development Project
BADC	Bangladesh Agricultural Development Corporation
BCIC	Bangladesh Chemical Industries Corporation
BDG	Bangladesh Government
BFA	Bangladesh Fertilizer Association
CCP	Commercial Credit Program
CCPF	Commercial Credit Program Fund
CDST	Customs Duty and Sales Tax
CIDA	Canadian International Development Association
C&F	Cost and Freight
CIF	Cost, Insurance, Freight
COP	Chief of Party
CTSPC	Chittagong Triple Super Phosphate Complex
CUFL	Chittagong Urea Fertilizer Limited
DAE	Department of Agricultural Extension
DANIDA	Danish International Development Agency
DAP	Di-ammonium Phosphate
DD	Demand Draft
DD&T	Dealer Development and Training
DGIS	Director General International Cooperation (The Netherlands)
FDI	Fertilizer Distribution Improvement
FLFUS	Farm-level Fertilizer Use Survey
FY	Fiscal Year
GDP	Gross Domestic Product
GKF	Grameen Krishi Foundation
Govt	Government
HA	Hectare
HCN	Host Country National
HYV	High Yielding Variety
IFDC	International Fertilizer Development Center
ILC	Inland Letter of Credit
JFCL	Jamuna Fertilizer Company Limited
LOP	Life of Project
MEC	Monitoring, Evaluation, and Computer
MIS	Management Information System
MOA	Ministry of Agriculture
MOF	Ministry of Finance
MOI	Ministry of Industry
MP	Muriate of Potash
MRP	Maximum Retail Price
MT	Metric Ton

NGFF	Natural Gas Fertilizer Factory
NGO	Non-Government Organization
PB	Participating Bank
PDP	Primary Distribution Point
PM&E	Planning, Monitoring, and Evaluation
PO	Pay Order
PUFF	Polash Urea Fertilizer Factory
SSP	Single Superphosphate
TA	Technical Assistance
TCCA	Thana Central Cooperative Association
TDP	Transportation Discount Point
TSP	Triple Superphosphate
TVA	Tennessee Valley Authority
UDP	Urea Deep Placement
UFFL	Urea Fertilizer Factory Limited
USAID	United States Agency for International Development
USG	Urea Super Granule
ZFCL	Zia Fertilizer Company Limited

GLOSSARY

Aman	Rice produced during late summer and fall (July through October)
Aus	Rice produced during the summer season (March through June)
Boro	Rice produced during the winter season (November through February)
District	Administrative unit in the charge of a Deputy Commissioner comprising a number of thanas
Fiscal Year	Starts from July of a calendar year and ends in June of the next calendar year
Grameen	Rural
Krishi	Agriculture
Rabi	Winter season (November through February)
Thana	Administrative unit of the local government below the district
Union	The lowest administrative unit of local government

EXCHANGE RATE

U.S.$ 1.00 = Tk. 40.00

I. INTRODUCTION

The Agriculture Sector in Bangladesh

The contribution of agriculture to the Gross Domestic Product (GDP) of Bangladesh varied between 51% in 1984-1985 at 1979-1980 prices and 38% in 1992-1993 at 1989-1990 prices. About 80% of the population lives in rural areas and most derive their livelihood from agriculture activities. In the mid 1990's, Bangladesh remains heavily dependent on agriculture. Growth in agriculture is, therefore, of crucial importance to the broader economic development.

Bangladesh has a net cropped area of about 9 million hectares of predominately alluvial soils and crop production, mainly rice and wheat, accounts for about 80% of the value of annual agricultural production. Three seasonal rice crops (Aus, Aman and Boro) cover about 74% of the total cropped area. Other important crops are jute, sugarcane, tea, tobacco, cotton, oilseeds, potato, and pulses (**Figure 1.1**).

Landholdings in Bangladesh are generally small, highly fragmented, and widely scattered. These characteristics limit the economical use of modern agricultural practices. A skewed distribution of land is evident in that about 11% of rural households own 52% of the total cultivable land and 33% are landless.

Food self-sufficiency, as a means to alleviate persistent and wide spread food shortages, has been the major goal of the Bangladesh Government (BDG) in agricultural development planning. Despite the high priorities afforded to the attainment of food self-sufficiency, the chronic food deficit stems from the sluggish and erratic growth of domestic production and the increasing food requirements for a population that is increasing by about 2.2% per year. The number of persons per cultivated hectare in Bangladesh increasing constantly. It increased from 10 persons in 1980-1981 to 14 persons in 1992-1993 (**Figure 1.2**).

Agricultural production is adversely affected by (1) limited land resources, (2) low productivity due to traditional subsistence agriculture, and (3) climatic forces. Increased food production must come from increased yield. Therefore, acceleration in agricultural production requires improved crop management practices including more efficient use of modern agricultural inputs such as irrigation, fertilizers, and HYV seeds. Accordingly, BDG set strategies in all the successive plans to stimulate agricultural production by assuring adequate and timely availability of irrigation, fertilizer, and improved seed.

The strategy in Bangladesh to increase agricultural production is based on the rapid diffusion of high input and output technology to achieve agricultural growth that exceeds population growth. Agricultural development efforts have long focused on providing support for and making investments in critical inputs such as fertilizers, seeds, irrigation, and pesticides. The fact that chemical fertilizers contribute substantially to food and agricultural production has been increasingly recognized and understood. Growth in fertilizer consumption is necessary if food production is to keep pace with population growth in Bangladesh.

Figure 1.1 Percentage Distribution of Cultivated Area by Crop In Bangladesh

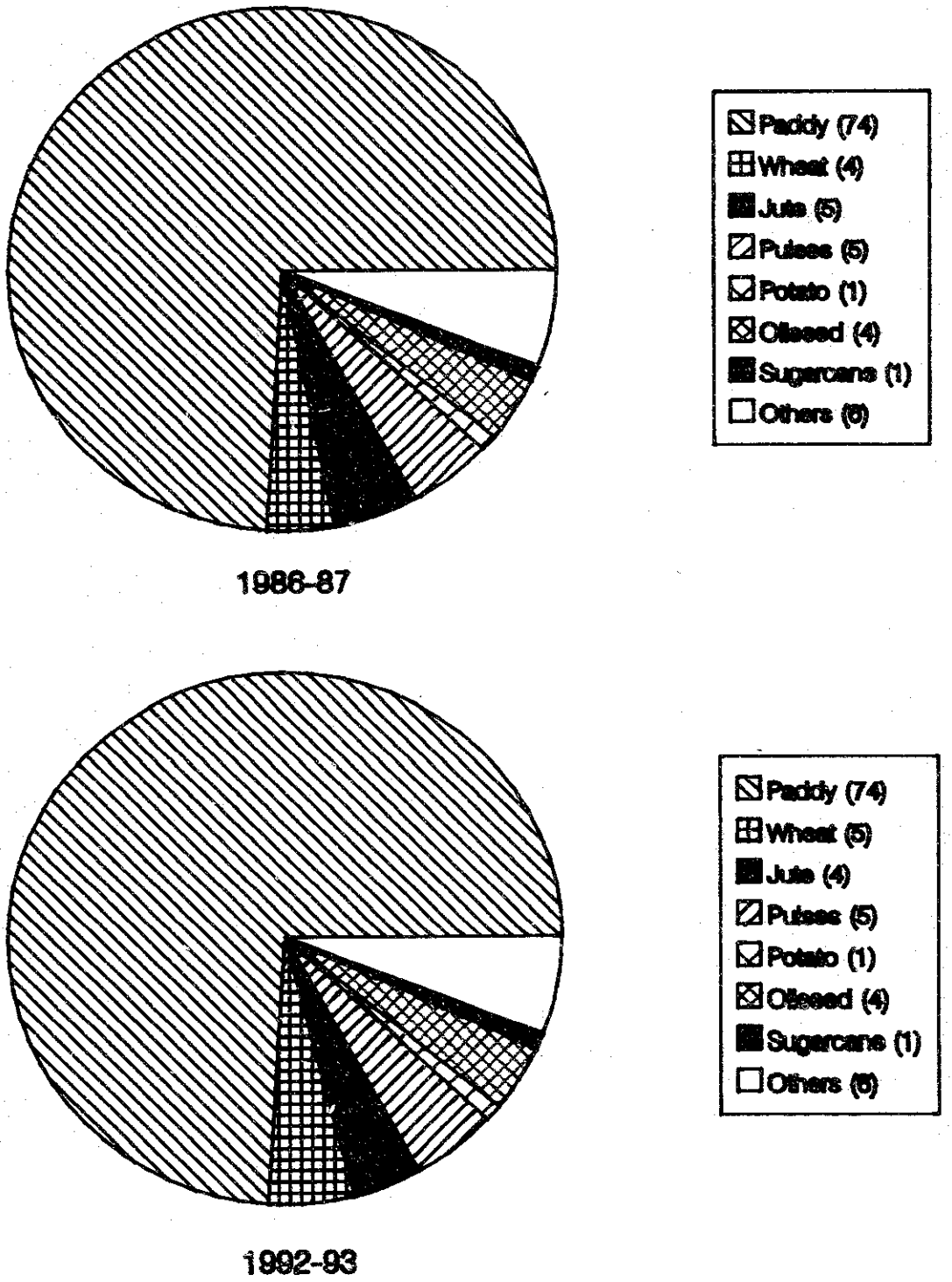
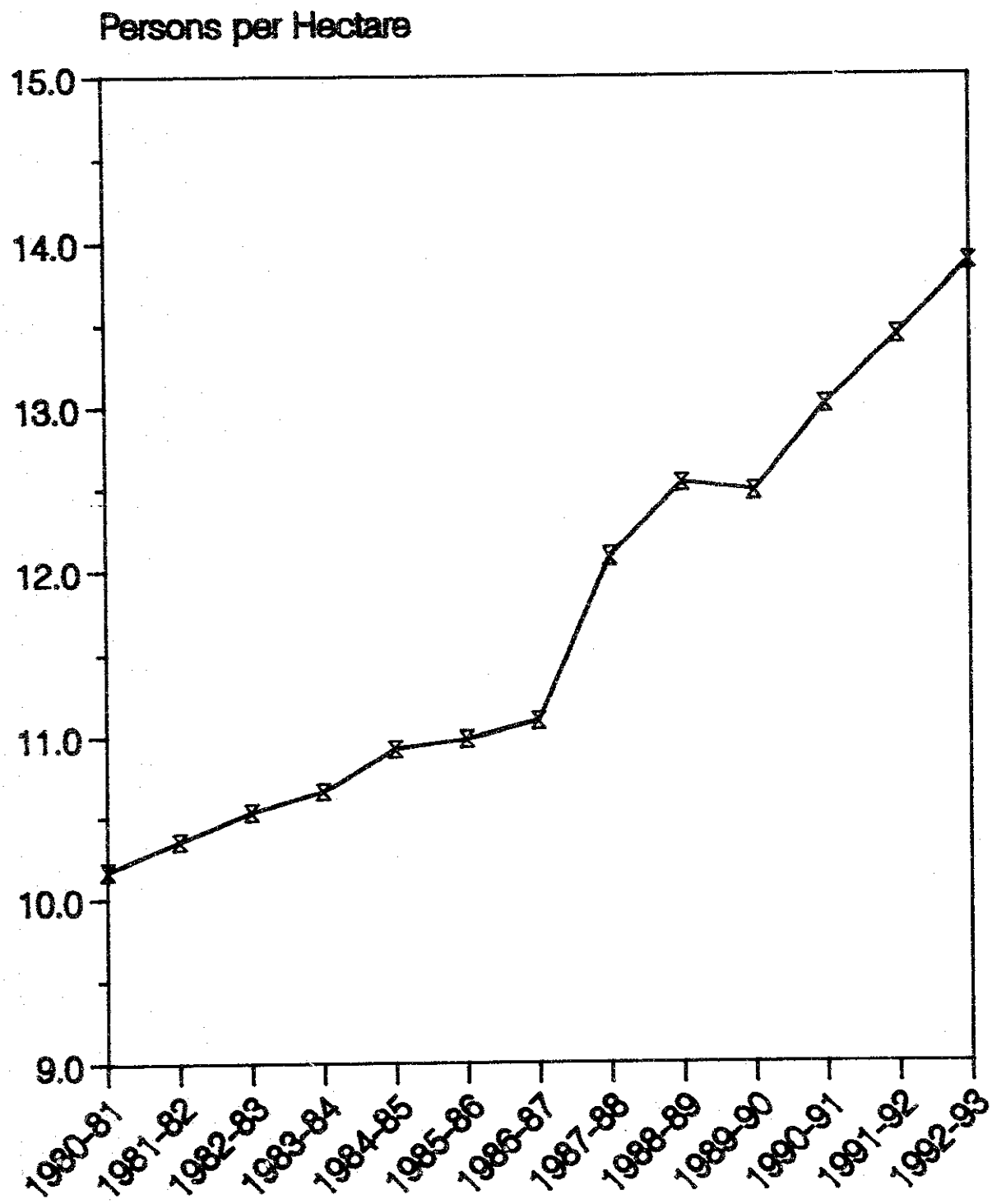


Figure 1.2 Number of Persons per Cultivated Hectare in Bangladesh 1981-1993



Fertilizer Marketing in Bangladesh

As demonstrated in Bangladesh and elsewhere, fertilizer use increases land productivity and increased land productivity is essential for economic growth and achievement of the national goal of rice self- sufficiency. The use of chemical fertilizer was introduced in Bangladesh in the early 1950's. During that time, fertilizers were procured, stored, and distributed by the Directorate of Agriculture. Inadequate arrangements and unsatisfactory progress in the program to manage inputs led to the creation of the Bangladesh Agricultural Development Corporation (BADC) in 1961. As a public entity, BADC sold fertilizer to private dealers and appointed dealers in every union of Bangladesh and BADC was responsible solely for all procurement, transportation, and storage of fertilizers for thanas.

Private dealers purchased fertilizers from BADC thana warehouses on a fixed commission basis and sold products to farmers at government controlled prices. This public sector system, termed here as the "old marketing system", suffered from excessive bureaucratic control and retarded the initiative of dealers, because (1) dealer appointments involved a time consuming selection procedure, (2) dealers were required to purchase fertilizers within a thana, although a neighboring thana warehouse may have been more accessible, and sell fertilizers within a defined area demarcated by distance from a thana warehouse, and (3) the shops and accounts of dealers were subject to periodic inspection by government. Although some relaxation allowed dealers to sell in hats and bazars and procure fertilizers from the most convenient BADC warehouse, the system was cumbersome, inefficient, expensive, and was not entirely conducive to sustainable agricultural growth and development.

In addition to retail and wholesale marketing constraints, heavily subsidized prices created a serious budget problem for BDG. The fertilizer subsidy amounted to 59% of the total budget of BADC and 4% of the total expenditures of BDG in 1976-1977. Moreover, erratic and inadequate domestic fertilizer production, limited storage capacity, inefficient handling of fertilizer imports, and foreign exchange shortages impeded the efforts of BADC to meet fertilizer demand without the assistance of development partners. The development partners addressed the fertilizer sector constraints through development projects with the intention to increase agricultural production in Bangladesh.

Starting in 1974, the assistance of the United States Agency for International Development (USAID) for the fertilizer sector in Bangladesh has involved six projects. These projects provided funds for fertilizer imports, warehouse and factory construction, and support for marketing improvements. The Fertilizer Distribution Improvement (FDI)-I was one of the pioneer projects that contributed to increased agricultural production by increasing fertilizer use.

The FDI-I project agreement was signed by BDG and USAID in July, 1978. The project goal, to increase food production through increased use of fertilizer on an equitable basis, was fully consistent with the goal of BDG to increase food grain production. The

project elements included finance for fertilizer storage, bulk handling, and agricultural input supply, technical assistance for institutional development, fertilizer imports and marketing, and policy reform to expand free market involvement in fertilizer distribution. The International Fertilizer Development Center (IFDC) was contracted by BDG and USAID to provide the required technical assistance and serve as consultants to MOA.

A new fertilizer marketing system was introduced in phases during 1978 to 1983 through the technical assistance under FDI-I. Major changes occurred with the new marketing system (NMS) which included (1) withdrawal of BADC from the thanas and selling fertilizers from 97 strategically located Primary Distribution Points (PDPs), later the number was reduced to 75 PDPs, (2) providing adequate warehouse capacity, staff, and accommodations to the PDPs to enable safe storage, timely delivery, and improved inventory control, (3) transfer of movement of fertilizers below PDPs to private wholesalers, (4) removal of restrictions on fertilizer trading, (5) allowing the purchase of fertilizer by any individual, cooperative society, or group of farmers from a PDP after nominal registration, (6) allowing wholesalers and dealers to transport fertilizer freely, except within a 5 mile border belt, and (7) decontrolling retail prices.

These reforms of FDI-I created a highly competitive group of private wholesalers and dealers and resulted in a marked improvement in fertilizer availability at competitive retail prices. Fertilizer sales increased from about 730,600 MT to 1,129,000 MT between 1977-1978 and 1983-1984, an annual growth rate of about 8% and about 55% during FDI-I.

The Need for FDI-II

The achievements of FDI-I provided policy makers and USAID an indication of the potential efficiencies which could be achieved in the fertilizer sector through an expansion of private sector investment in fertilizer marketing. The expectation that further gains could be made and were indeed necessary to sustain the "new marketing system" led to FDI-II. FDI-I enabled the transfer of downstream fertilizer marketing to the private sector. But some tasks were incomplete. The FDI-I project provided a foundation and demonstrated the need to transfer the fertilizer distribution network entirely to the private sector. Much progress was made under FDI-I, but continued technical assistance was necessary to fulfill the development objective of the BDG to establish an efficient fertilizer program based on the full participation of a competitive private sector. The need to continue technical assistance was understood by both the BDG and the USAID because fertilizer use remained low in Bangladesh compared to other Asian countries[1], and less than two-thirds of Bangladeshi farmers used chemical fertilizers. The availability of fertilizers at a reasonable price, technical knowledge regarding fertilizer use, and the availability of working capital were identified as three factors that constrained fertilizer use in Bangladesh. The FDI-II project was designed to mitigate these constraints and increase fertilizer use.

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[1] Fertilizer use in 1982-1983 (Kg of nutrient per hectare): Bangladesh 35, Korea 374, Malaysia 102, Sri Lanka 76, Indonesia 63 and Pakistan 49. Project Paper FDI-II, August, 1984.

II. THE FDI-II PROJECT

Project Goal and Purpose

The goal of the FDI-II project was to increase agricultural production and the achievement would be measured against one objectively verifiable indicator, agricultural production was to increase at a minimum rate of 4% annually. The logical framework as indicated in the project paper is shown in **Annex I**. The purpose of the project was to increase use of fertilizer which could be achieved by focusing on the establishment of a free, competitive, and open fertilizer marketing system. The project included the following four major components:

Policy Reform: Identification, formulation, and recommendations of policies that provide the foundation for a viable private sector fertilizer marketing system.

Commercial Credit Program: Provide funds through the commercial banking system to finance a fertilizer dealer credit program and fertilizer imports.

Dealer Development and Technology Transfer: Augment the technical skills of fertilizer wholesalers and dealers to improve the efficiency of fertilizer suppliers, actively promote proper fertilizer use, and better advice to farmers.

Management Information System: Develop a management information system to collect and disseminate information on fertilizer sales, imports, stock, prices, and availability that helps to ensure transparency in fertilizer marketing and provides policy makers with improved and timely information as a basis for sound policy development.

An average annual growth of at least 8% in aggregate fertilizer consumption over the life of project (LOP) was the indicator against which project accomplishments would be measured.

Project Outputs

The expected project outputs as stated in the project paper were as follows:

Output	:	Assure an adequate supply of fertilizers throughout Bangladesh.
Indicator	:	Minimum domestic stock of a five month inventory of phosphates and potash and a three month inventory of urea.

Output	:	Provide funds to finance a fertilizer credit program for importers, distributors, and dealers.
Indicator	:	Distributors and dealers purchasing fertilizer with FDI-II credit.
Output	:	Develop large-scale private sector wholesalers with a potential to market fertilizers throughout Bangladesh.
Indicator	:	A significant number of fertilizer wholesalers purchasing from depots, factories and ports.
Output	:	Increase efficiency in fertilizer distribution and marketing.
Indicator	:	Decreases in the per unit cost of fertilizer distribution.
Output	:	Activate fertilizer dealer development and sales promotion programs.
Indicator	:	Dealer development and training program assessed and found effective.
Output	:	Improve access to fertilizer sales outlets by the private sector.
Indicator	:	Improved physical accessibility to fertilizer sales outlets.

The Project Agreement and Contract

The FDI-II project agreement between the BDG and the USAID (Project Contract Number 388-0060-HCC-8701-01) was signed on August 30, 1984. According to this agreement, FDI-II would be managed by BDG who would contract an international organization to provide technical assistance to help implement and monitor reforms in fertilizer distribution and marketing. The contract would be a level of effort type and the technical assistance would include advisory services, production and distribution of sales promotion materials, training, and equipment purchases. As in FDI-I, IFDC continued to provide technical assistance in FDI-II.

As a condition of the FDI-II agreement, a contract was signed between BADC and IFDC on February 28, 1987 to provide technical assistance in implementing the project from March 1, 1987 to June 30, 1991. The contract between BADC and IFDC was amended three times between February, 1987 to September, 1989 keeping all terms and conditions of the March, 1987 contract intact, except some adjustments and enhancem in the costs of the project. Subsequently, in the fourth amendment on March 27, 1989, a novation contract was signed between BADC, IFDC, and Ministry of Agriculture (MOA) to substitute the government as a party to the contract in place of BADC. The contract between BDG and IFDC was amended twice between August, 1990 and June, 1991 to adjust the cost and extend the project completion date until March, 1992. However, a seventh amendment was signed between Ministry of Agriculture and IFDC to extend the implementation period for an additional 29 months starting from April 1, 1992 to August

29, 1994 with further enhancement of the estimated budget for the extended period. The eighth and final amendment made some adjustments in costs of technical assistance.

Technical Assistance

IFDC was selected and contracted to provide technical assistance to MOA to establish and institutionalize the following:

- Ensure that private sector resources are integrated and used in procuring and marketing fertilizers.
- Improve and institutionalize market research, service functions, quality controls, new product research and development, and data collection and analysis in the public and private sectors with strong linkages between the two.
- Increase the capacity of the private and public sectors to plan, manage, and evaluate fertilizer needs and priorities.
- Improve and strengthen BDG and the ability of the private sector to produce and disseminate information about new agricultural technologies and to use existing technologies and resources to meet the needs of fertilizer dealers and farmers.
- Strengthen the effectiveness of the public and private sectors in human resource development, financial management, stock accountability, and business management in fertilizer related activities.

The specific scope of work for the technical assistance component of FDI-II is shown in **Annex II** and was to be accomplished through the efforts of a number of consultants with long term and short term assignments. The planned level of effort for the performance was 11,340 person-months of direct labor, including approximately 256 person-months long term expatriates, and 11,084 person-months of local professional, technical, administrative, and clerical staff, with about 108 person months of short term expatriate and local consultants during the 90 months life of contract. The total estimated cost of the technical assistance is shown in **Table 2.1**.

IFDC was responsible for monitoring and assisting with the implementation of developing a national fertilizer distribution system and other FDI-II outputs including policy reform, training, agribusiness marketing, credit, imports, and dealer development activities. IFDC also provided consultants, commodities, and training to accomplish the project scope of work. In addition, FDI-II was to provide the following: (1) LOP work plan, (2) training

plan, specifying career development training for BDG personnel and market and sales business management training for bankers, and private distributors, (3) quarterly and annual reports summarizing the work performed by the project, (4) MIS reports on fertilizer imports, marketing and distribution, monthly farm-level fertilizer prices and availability, (5) monthly commercial credit reports, (6) farm-level fertilizer use survey reports, (7) reports on special studies, and (8) an end of project report.

Table 2.1 The Estimated Costs of the FDI-II Project

Costs	Original contract with BADC through amendment 6	Contract amendment 7	Total estimated budget	Revised budget as per amendment 8
	Million U.S.$			
Resident consultants	2.13	1.53	3.66	3.19
Short term consultants	0.57	0.50	1.07	1.08
FDI-II office	3.07	3.21	6.28	6.49
IFDC Headquarters	0.09	0.06	0.15	0.17
Special projects	0.50	0.10	0.60	0.59
Training	0.77	1.10	1.87	1.84
Sub-total	7.13	6.50	13.63	13.36
IFDC Management Fee	2.82	2.58	5.40	5.17
Total	9.95	9.08	19.03	18.53

Source: FDI-II
Notes : 1. Figures are rounded.
2. FDI-II office includes local specialists, technicians, and other staff.

Responsibilities of BDG

The BDG was responsible to oversee the progress of the project. Specifically, BDG would (1) facilitate prompt customs clearance of project equipment, materials, supplies, and personal effects of the contractors including issuing passbooks necessary for purchase of duty free goods, (2) provide entry and exit visas, residence permits, and exchange permits to the expatriate consultants, (3) appoint local counterparts to work with expatriate consultants, (4) to remove the constraints to project implementation, and (5) provide customs duty and sales tax, if duty free entry of project equipment and materials are not allowed.

III. IMPLEMENTATION AND ACHIEVEMENTS OF FDI-II

The FDI-II project began in March, 1987. The FDI-II staff, in collaboration with BADC, MOA, and USAID, implemented and coordinated the project. The efforts of FDI-II concentrated on the four major elements: policy reform, credit, dealer development and technology transfer, and a management information system.

Policy Reform

Fertilizer policies formed an integral part of FDI-II in supporting the primary objective of BDG to establish sustainable agricultural production and achieve self-sufficiency in food grain production. It was determined that greater involvement of the private sector was essential to increase the efficiency of fertilizer marketing and distribution. Thus, the nexus of fertilizer policy initiatives of FDI-II focused on establishing a free market where the private sector could flourish in fertilizer marketing. The FDI-II project proposed policy reforms involving completely new concepts for fertilizer marketing in Bangladesh. The BDG implemented these policy reforms, albeit with some initial skepticism. The reforms designed by FDI-II were comprehensive, complementary, and focused on fertilizer market development, subsidy removal, and the reorganization of BADC.

Fertilizer Market Development

TDP Program: In July, 1987, IFDC recommended the creation of transportation discount points (TDPs) that would allow private distributors to purchase fertilizers at discount prices from factories and 4 major TDPs. The intention was to prepare the private sector distributors to manage national fertilizer distribution and allow BDG to save money by transferring responsibility for transportation to the private sector. The BDG implemented this recommendation and the operation of the TDPs led to a significant shift in fertilizer transportation responsibility from BADC to the private sector. By December, 1988, about 22% of the total fertilizer sales were made to private wholesalers through TDPs (**Table 3.1**).

The TDP concept of FDI-II was theoretically sound and sales through PDPs to dealers appointed by BADC declined. However, the success of this concept led to new problems that required creative solutions. The new private sector showed some strength and naturally there was some resistance by the vested interests in public sector.

Direct Procurement of Urea from Domestic Public Sector Factories: The unwillingness of BADC to cooperate with and prepare private sector distributors to manage larger scale operations in fertilizer distribution made the TDP operations inefficient and

unable to supply fertilizer as needed and expected. The private dealers experienced severe supply interruptions and shortages while working with the TDPs. This hindrance to policy reform was a major obstacle for the FDI-II project and resulted in serious fertilizer shortages at the farm-level, despite excessive domestic stock. Clearly, another strategy was needed.

Table 3.1 Aggregate Fertilizer Sales from July, 1988 to December, 1988

		BADC Sales						Direct BCIC sales to private distributors	
		PDPs		TDPs		TSCs			
Month	Total sales	Quantity	Percent of total sales	Quantity	Percent of total sales	Quantity	Percent of total sales	Quantity	Percent of total sales
	MT		%	MT	%	MT	%	MT	%
July	82,834	68,230	82	9,386	11	1,223	2	3,995	5
August	119,571	95,396	80	14,747	12	1,740	2	7,688	6
September	131,775	112,423	85	12,332	10	1,416	1	5,604	4
October	155,479	126,059	81	25,913	17	825	(-)	2,682	2
November	181,217	141,455	78	35,982	20	504	(-)	3,276	2
December	111,915	79,596	71	24,208	22	1,187	1	6,924	6

Source: BADC Fertilizer Newsletter

Notes: 1. TSCs = Thana sales centers operate only in the Chittagong Hill Tracts.
2. All TDP and PDP sales are to the private sector.
3. Percentages are rounded.
4. (-) indicates less than 1%.

The major FDI-II policy reform that allowed distributors to procure fertilizer directly from the Ghorasal factory was implemented by BDG in March 14, 1989 and direct procurement from all factories was permitted beginning on July 1, 1989. Initially, the government allowed the private distributors to procure fertilizer directly from factories on a 50:50 quota with BADC. This was a policy compromise of sorts. Through constant monitoring of farm-level fertilizer availability and prices by FDI-II, it was apparent that BADC accumulated huge stocks of urea and private distributors were unable to procure supplies from BCIC factories on demand due to the 50:50 quota system. To solve this problem, the government decided to cancel the 50:50 quota system. At this point, FDI-II recommended a policy of free competition in the purchase of urea from domestic factories. One study[2] conducted by FDI-II demonstrated that this major policy initiative had an immediate, substantial, and positive consequences for the private fertilizer sector. Fertilizer distributors immediately responded and started to purchase aggressively fertilizer from the factory. This reform resulted in improved availability of urea throughout the country and competition in the fertilizer market lead to considerable decreases in farm-level prices.

[2] FDI-II, Low Cost Intervention Study for the Fertilizer Market of Bangladesh, November, 1989.

Direct Procurement of TSP and MP from Factories and Ports: Recognizing the demonstrated ability of the private sector to purchase urea from domestic factories and affect prices favorably, BDG allowed direct sales of TSP, MP, and other fertilizers from factories and ports at a discount of Tk.400 per MT in July, 1989. This provided the private sector an opportunity to expand their contribution to improved fertilizer marketing. The transportation costs of BADC were in excess of Tk.550.00 per MT. Therefore, it became apparent quickly that BADC would not be able to compete with the efficiencies being realized through the private sector. As a matter of logical progression in policy reform, fertilizer imports by the private sector were required.

Direct Importation of Fertilizers by the Private Sector: FDI-II envisaged a phased entry of the private sector into procurement and distribution. To continue with the policy of fertilizer market privatization, FDI-II provided policy analyses and recommendations to support the direct importation of fertilizer by the private sector and in 1991 the BDG permitted such imports. This reform further strengthened the development of a private fertilizer sector.

Transfer of BADC Warehouses to Other Public Sector and Private entities: The fertilizer sector policy reforms created a situation that made all BADC fertilizer warehouses redundant, except those operating in Chittagong Hill Tracts. Therefore, FDI-II proposed the transfer of BADC warehouses to other sectors of the government, such as the Ministry of Food as well as selling or leasing these warehouses to private distributors and companies. Despite resistance from BADC, this proposal was accepted by the BDG.

Removal of Subsidy

Market liberalization is closely linked with pricing policy. Fertilizer prices were subsidized since the beginning of chemical fertilizer use in Bangladesh in the early 1950's. In the early 1980's, with the recommendation of FDI-I, BDG implemented policies to eliminate gradually all subsidies on fertilizers. This gradual approach prevented abrupt change that would have caused confusion in the fertilizer market. As a result of this policy change, fertilizer prices increased progressively. This resulted in a reduction of the subsidy costs of BDG from about Tk.1,153 million in 1980-1981 to Tk.286 million in 1986-1987. This policy was remarkable in that increased prices did not cause sharp decreases in fertilizer consumption. Although there was no subsidy on urea fertilizer from 1985-1986, the subsidy on TSP and MP continued (**Tables 3.2 and 3.3**).

Continuing the subsidy on TSP and MP involved price regulation and administrative intervention, which was inconsistent with the development of a free and competitive market. Moreover, in addition to the budgetary burden and allocation inefficiency, the existence of the subsidy constrained the BDG in conducting important policy reforms to realize the gains from internationally competitive imports. Therefore, the last and final step in the process of privatization of fertilizer procurement, marketing, and distribution was the

removal of subsidies from TSP and MP. This process began in August, 1991 and was completed in December, 1992. Since January, 1993, fertilizer has been procured from domestic public sector factories or through imports on a full cost basis and distributed by the private sector.

Table 3.2 Procurement Cost, Issue Price, and Subsidy on TSP

Fiscal year	Procurement prices (weighted average factory and port prices)	Transportation and distribution cost from factory and port		Total cost (procurement and distribution)		BADC issue prices (selling to private sector)		Actual subsidy	
		PDP	TDP	PDP	TDP	PDP	TDP	PDP (Col.5-7)	TDP (Col.6-8)
1	2	3	4	5	6	7	8	10	11
	Tk per MT								
1985-1986	5,352	835		6,187		4,725		1,462	
1986-1987	5,694	657		6,351		4,725		1,625	
1987-1988	6,123	690		6,813		4,725		2,088	
1988-1989	7,113	754	624	7,867	7,737	4,725	4,595	3,142	3,142
1989-1990	6,768	754	457	7,522	7,225	4,725	4,428	2,797	2,797
1990-1991	7,301	754	388	8,055	7,667	4,725	4,337	3,330	3,330
1991-1992	7,432	754	191	8,186	7,623	5,836	5,273	2,350	2,350

Source: BADC Fertilizer Newsletter and FDI-II

Notes : 1. Procurement and issue prices are weighted average prices of quantity procured by BADC and sold from PDP's or TDP's.
2. Transportation and distribution costs per MT are calculated as total cost incurred for transportation and distribution divided by the total quantity.
3. From 1988-1989 transportation and distribution costs per MT is kept constant considering that the private sector started procurement directly from the factories and ports.

Table 3.3 Procurement Cost, Issue Price, and Subsidy on MP

Fiscal year	Procurement prices (weighted average port prices)	Transportation and distribution cost from port		Total cost (procurement and distribution)		BADC issue prices (selling to private sector)		Actual subsidy	
		PDP	TDP	PDP	TDP	PDP	TDP	PDP (Col.5-7)	TDP (Col.6-8)
1	2	3	4	5	6	7	8	10	11
	Tk per MT								
1985-1986	3,628	835		4,463		4,000		463	
1986-1987	2,978	657		3,635		3,725			
1987-1988	3,240	690		3,930		3,725		205	
1988-1989	4,407	754	624	5,161	5,031	3,725	3,595	1,436	1,436
1989-1990	5,307	754	488	6,061	5,795	3,725	3,459	2,336	2,336
1990-1991	5,754	754	427	6,508	6,181	3,725	3,398	2,783	2,783
1991-1992	5,793	754	488	6,547	6,281	4,535	4,269	2,012	2,012

Source: BADC Fertilizer Newsletter and FDI-II

Notes : 1. Procurement and issue prices are weighted average prices of quantities procured by BADC and sold from PDP's or TDP's.
2. Transportation and distribution costs per MT are calculated as total cost incurred for transportation and distribution divided by the total quantity.
3. From 1988-1989 transportation and distribution costs per MT is kept constant considering that the private sector started procurement directly from the ports.

Reorganization of BADC

The increased involvement of the private sector in the fertilizer market required a review and restructuring of BADC. FDI-II evaluated the role of BADC and presented a plan for reorganization. Several studies were conducted between March, 1989 and October, 1992 that took into account the changes in fertilizer distribution. The proposed initial plan emphasized concepts and activities that would permit BADC to respond to new and additional agricultural development opportunities. This plan suggested that the existing regional offices of BADC should be reorganized as centers for promotion, development, market research, monitoring, demonstration, and technology transfer activities related to fertilizer marketing. But resistance from the employees' union of BADC and the presence of BADC in the fertilizer sector was a hindrance. FDI-II suggested that all responsibilities for monitoring farm-level prices, quality control, stock availability, and import of agricultural inputs should be entrusted to a monitoring cell in the Ministry of Agriculture. IFDC among others, also suggested a phasing out of the redundant staff of BADC through an attractive voluntary retirement policy. But vocal resistance from the employees union of BADC made it difficult for BDG to implement the recommendations of FDI-II.

Achievements in Policy Reform

The successful implementation of policy reforms in the fertilizer sector was marked by unique achievements. Some of the major achievements in policy reform are discussed below.

Reorganization of the market structure: The policy reforms helped to improve the efficiency of the private sector in marketing fertilizer and competition in the fertilizer trade increased. A vigorous group of importers, distributors, dealers, and retailers emerged as a consequence of market reorganization. According to IFDC estimates, between 1987-1988 and 1993-1994, the number of importers increased from nil to 215, distributors increased from nil to about 1,400, dealers increased from 6,000 to 13,000 and the number of retailers increased from 36,000 to 108,000[3] (**Table 3.4**). These figures are excellent indicators of the success of FDI-II and the privatization of the fertilizer trade in Bangladesh.

The market share of the private fertilizer sector increased dramatically. The aggressiveness and the speed with which the private sector entered fertilizer market and penetrated the countryside had a sudden and sharp impact on the fertilizer operations of BADC. The private sector market share rapidly increased and BADC sales decreased dramatically. The public sector share of the national fertilizer market decreased from 100% in 1986-1987 to less than 1% in 1993-1994. This is also an excellent indicator of the success of FDI-II and is shown in **Table 3.5 and Figure 3.1**.

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[3] The number of importers, distributors, dealers and retailers, however, may be less than what is stated during the lean period of fertilizer demand.

Table 3.4 Estimated Number of Private Fertilizer Importers, Distributors, Dealers, and Retailers, 1987-1994

Business Type	Fiscal year						
	1987-1988	1988-1989	1989-1990	1990-1991	1991-1992	1992-1993	1993-1994
Importers				147	215	215	215
Distributors		143	276	590	1,271	1,335	1,398
Dealers	6,000	6,500	7,800	8,500	9,500	12,000	13,000
Retailers	36,000	43,500	47,200	71,500	100,500	104,000	108,000

Source: FDI-II

Table 3.5 Public and Private Sector Fertilizer Imports in Bangladesh from 1986-1987 to 1993-1994 by Product

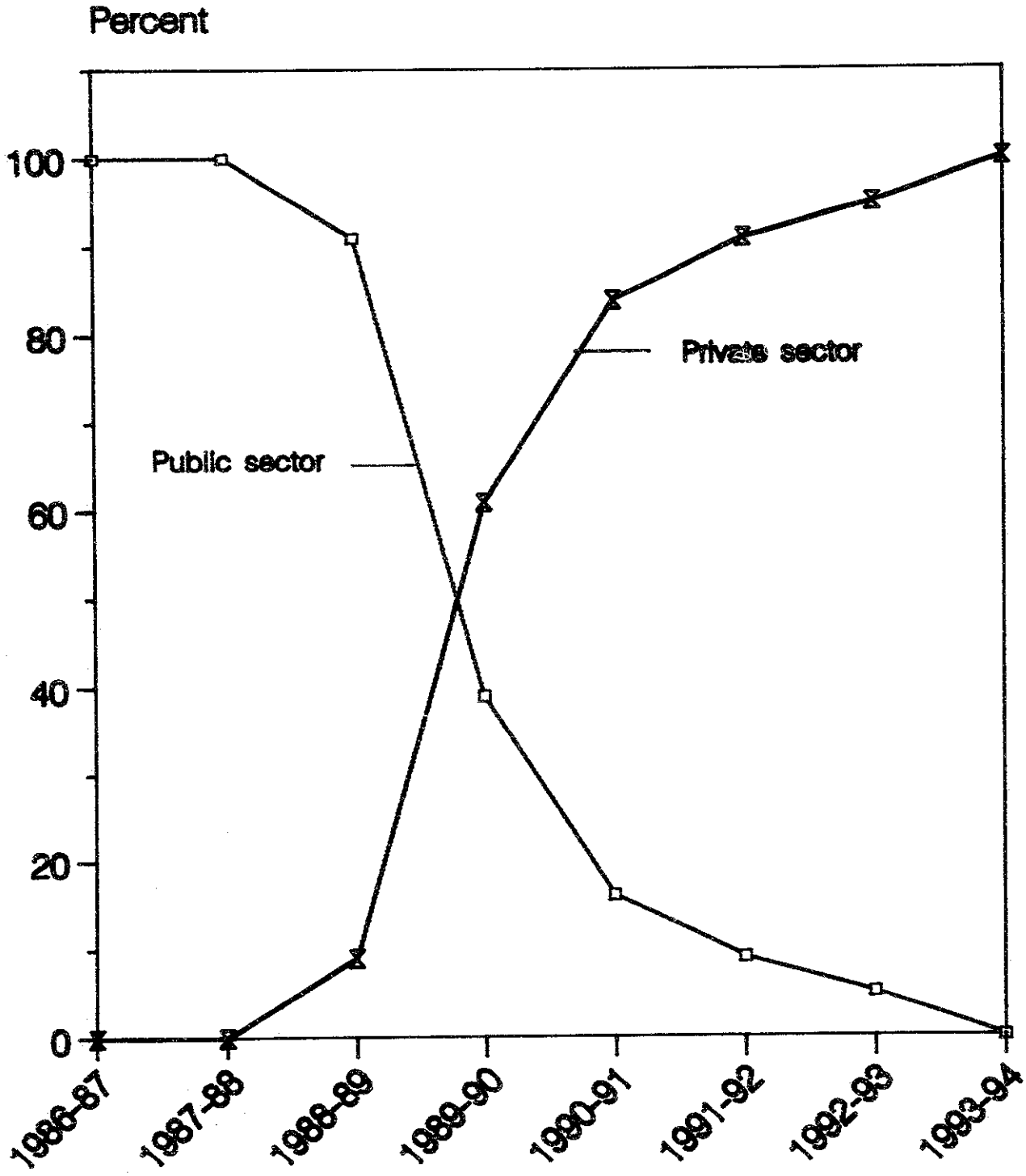
Fiscal year	Urea		TSP		MP		Zinc		DAP		SSP		AS		Total	
	Public sector	Private sector	Public sector	Private sector	Public sector	Private sector	Public sector	Private sector	Public sector	Private sector	Public sector	Private sector	Public sector	Private sector	Public sector	Private sector
	'000' MT															
1986-1987			93		47		5						6		151	
1987-1988			191		83								2		276	
1988-1989			379		148		3						5		535	
1989-1990	61		232		76		5								374	
1990-1991			312		146								1		459	
1991-1992		15	319	147	100	20	6								425	182
1992-1993				239		78		1		33						351
1993-1994				125		101		3				86		6		321

Source: BADC Fertilizer Newsletter and FDI-II
Note : Figures are rounded.

Private sector is managing the importation of all fertilizers at full cost. With the policy changes on imported fertilizer, the private sector in Bangladesh gradually and successfully entered the international market. The public sector share of fertilizer imports declined from 100% in 1990-1991 to nil in August, 1994 (**Table 3.5**). The ability of the private sector importers to negotiate CIF prices is commendable in that their costs for TSP imports were on average 10% lower than those of the public sector. For imported MP, private sector CIF price were 8% lower on average (**Table 3.6**). This is an excellent example of what the private sector can and should accomplish.

The private sector imported fertilizer in accordance with market demand and was free to import fertilizer without having to go through the MOA and the Chief Controller of Imports and Exports. Imports from the least expensive sources and a quantity which earns a profit is necessary. The private sector found that with foreign loans or grants imports are more cumbersome and expensive compared to imports with cash foreign exchange and this economic factor motivated importers to purchase fertilizer with cash foreign exchange. The share of imported fertilizer increased with cash foreign exchange compared to that with

Figure 3.1 Share of Fertilizer sales in the Public and Private Sector, 1986-94



donor funds and is shown in **Figure 3.2**. The use of cash foreign exchange for importing fertilizer demonstrates the eagerness of private distributors to use their own resources rather than depending on donor funds. This is further evident in that no donor funds were used for imports in 1993-1994.

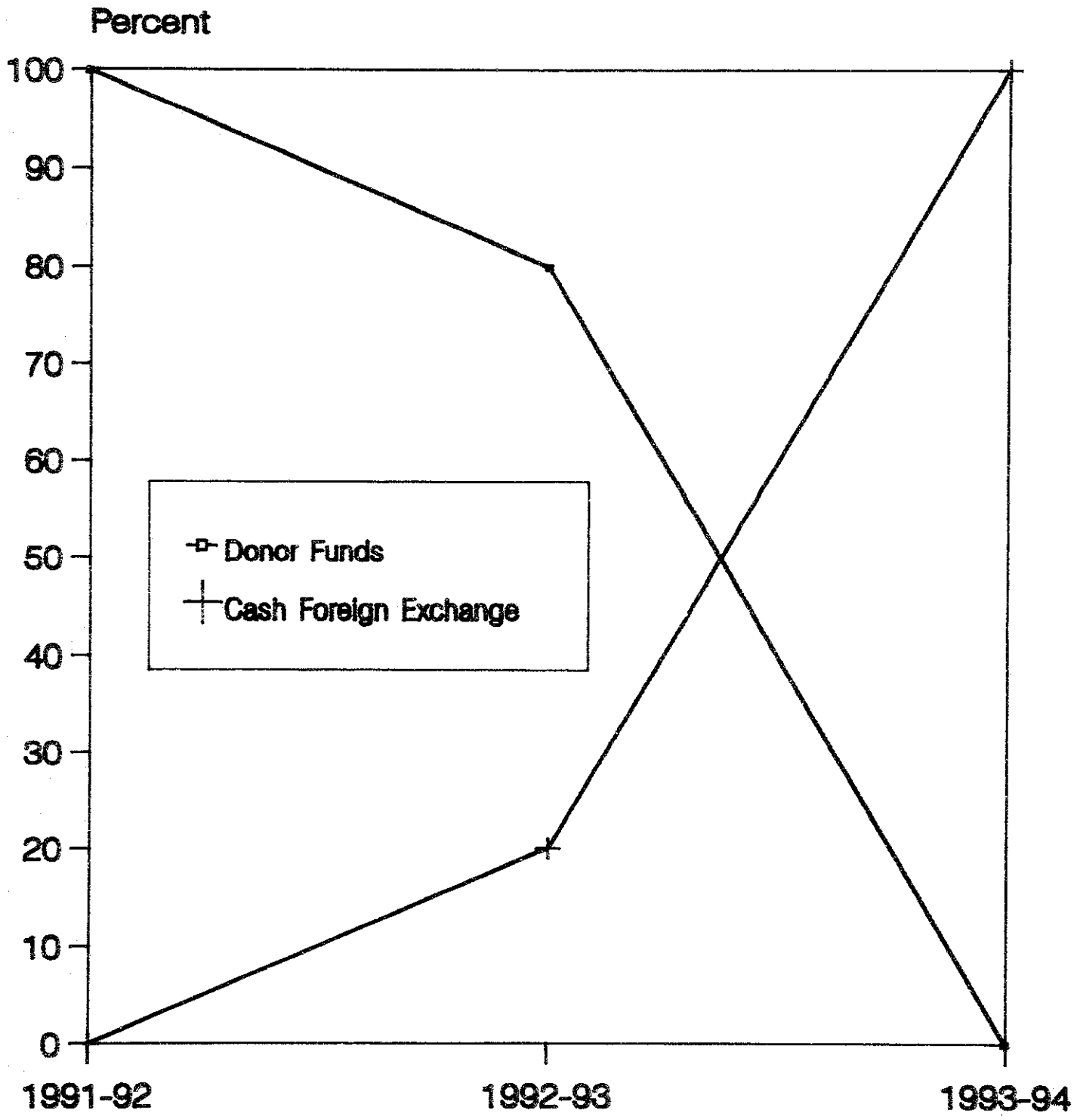
Table 3.6 Import Prices of TSP and MP Procured by BADC and the Private Sector in 1991-1992

Product	Sector	Quantity (MT)	CIF price (U.S.$ per MT)	Origin	Date of arrival
TSP	BADC	14,450	220.15	Morocco	July 22, 1991
		20,994	194.00	USA	November 13, 1991
		20,877	194.15	USA	December 8, 1991
		19,350	203.00	Morocco	December 31, 1991
		14,000	201.75	USA	January 17, 1992
		25,004	209.65	USA	February 7, 1992
	Private	21,000	184.00	USA	July 20, 1991
		24,200	178.00	USA	November 6, 1991
		16,765	189.19	Indonesia	December 11, 1991
		7,667	186.10	Indonesia	December 30, 1991
		16,809	180.00	USA	January 5, 1992
		15,937	180.00	USA	February 5, 1992
MP	BADC	18,764	154.16	Canada	November 13, 1991
	Private	19,925	142.44	Canada	December 18, 1991

Source: BADC and FDI-II

TDP and PDP operations of BADC closed. Substantial improvements in marketing services to the fertilizer retailers and the farm-sector are discernible from the work of FDI-II. These developments had consequence for BADC operations. As the TDP operations gained momentum, sales at many PDPs declined. The BDG officially closed 15 PDPs on July 1, 1989 and another 14 on January 1, 1990. Although government orders were not issued for the closure of the remaining PDPs, eventually all PDPs were closed. The TDPs are also now redundant because private sector distributors changed procurement from TDPs to BCIC factories and imports, except on a very small scale in the Chittagong Hill Tracts. In view of the proposal submitted by FDI-II to transfer, lease, or sell fertilizer warehouses to other public sectors and private parties, MOA issued an order asking BADC to transfer the warehouses to other government departments, private individuals, and fertilizer dealers.

Figure 3.2 Percentage Share of Fertilizer Imports by Source of Funds from 1991-92 to 1993-94



Of the 469,600 MT capacity of the warehouses, BADC with much reluctance transferred to the Ministry of Food, leased, or sold to private distributors only about 95,700 MT capacity, and thus retains a 373,900 MT redundant capacity.

The effect on farm-level fertilizer prices was dramatic. With direct purchases of fertilizer from BCIC factories and ports by the private sector, farm-level prices of urea, TSP, and MP decreased steadily. The monthly national average price of urea weighted by quantity purchased by farmers decreased by Tk.23, TSP by Tk.9 and MP by Tk.15 per 50 kg between April and December, 1989 (**Figure 3.3**). Wholesale and retail competition promoted cost effectiveness in the fertilizer delivery system and farmers benefitted from lower fertilizer prices. However, changes in issue prices and subsidy withdrawal at different times after 1989-1990 resulted in increased farm-level prices. But real farm-level prices of urea, TSP, and MP decreased by Tk.50 per bag between 1986-1987 and 1993-1994 at 1984-1985 constant prices (**Figure 3.4**).

The private sector achieved cost efficiencies in fertilizer distribution. After FDI-II policy reform, fertilizer prices decreased steadily, but changes in issue prices and subsidy withdrawal at different times resulted in increased farm-level prices, especially for TSP and MP. BCIC increased the ex-factory price of urea from Tk.4,025 per MT in December, 1991 to Tk.4,725 per MT in July, 1992, a Tk.35 per 50 kg increase during a 7 month period.

The government also phased out the subsidy on TSP. The issue price of TSP was increased by Tk.3,145 per MT or Tk.157 per 50 kg between August, 1991 and December, 1992. Similarly, the price of MP was increased by Tk.2,467 per MT during the same period, an increase of over Tk.123 per 50 kg. Clearly such cost increases were an inevitable consequence of the subsidy removal and the increases in the factory gate and issue prices were ultimately passed on to farmers.

A comparison of fertilizer prices before and after privatization is presented in **Table 3.7**. An attempt has been made to compare the two periods taking into account the moderate fertilizer demand months of June-August. Before privatization, in the months of June, July and August, 1988, BADC procured urea and TSP at a cost of Tk.3,709 and Tk.5,900 per MT, respectively, from the factories and ports. BADC also procured MP at Tk.3,395 per MT from the ports during the same period.

In addition to the ex-factory and port prices, the distribution cost to the PDPs was Tk.690 per MT. Therefore, the total procurement cost of BADC to provide fertilizers to PDPs was as follows: Tk.4,399 per MT for urea, Tk.6,590 per MT for TSP, and Tk.4,085 per MT for MP. The BDG then fixed the issue price (i.e. the selling price per MT to the private dealers from PDPs) at Tk.4,525 for urea, Tk.6,590 for TSP, and Tk.4,085 for MP. The prices for TSP and MP were subsidized. The private dealers purchased urea, TSP, and MP at these prices from PDPs, sold products to farmers at varying prices, and earned a small profit. Therefore, the actual distribution cost from port or factory to the farm-level

Figure 3.3 Average Farm-level Prices of Fertilizers April to December, 1989

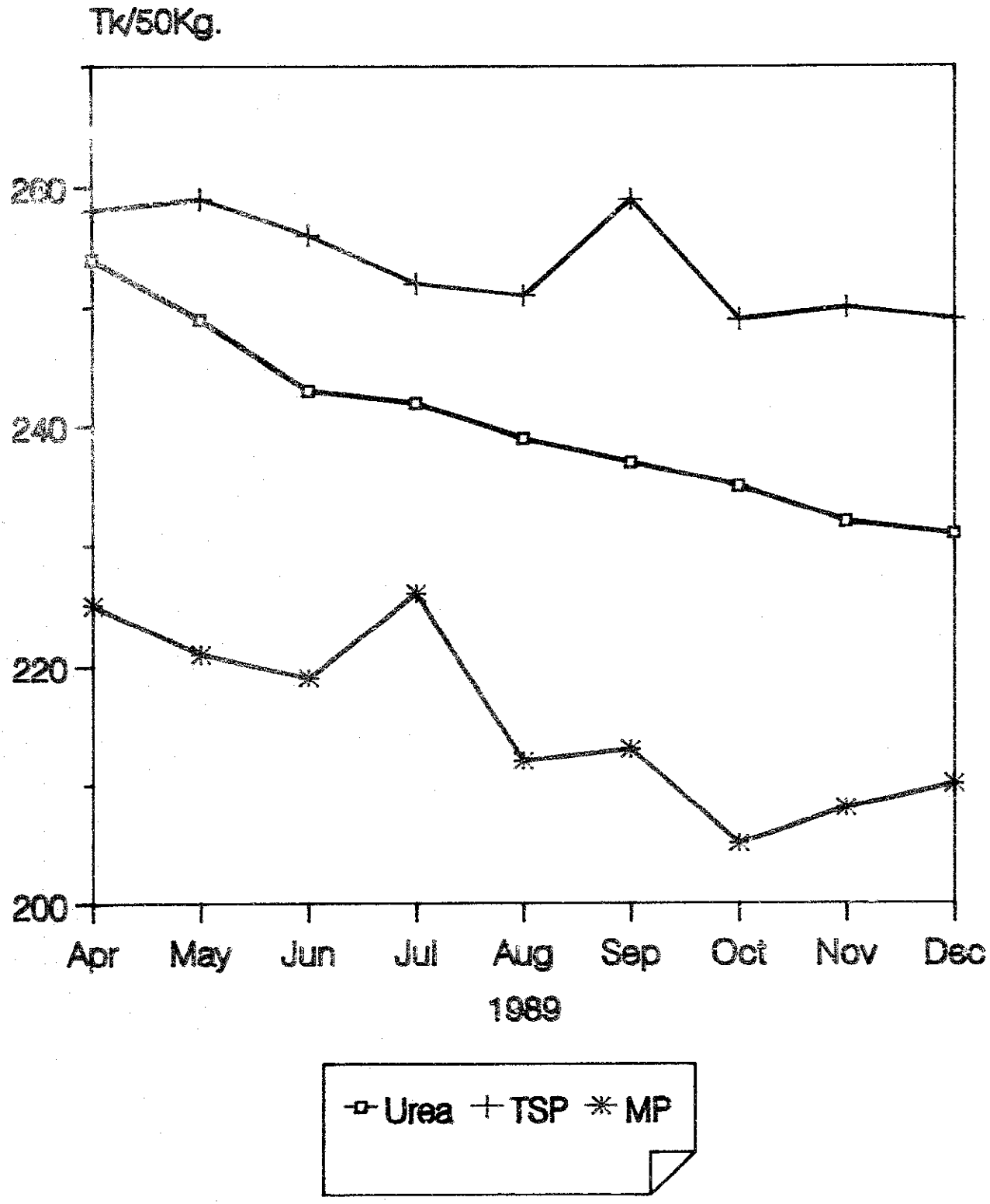
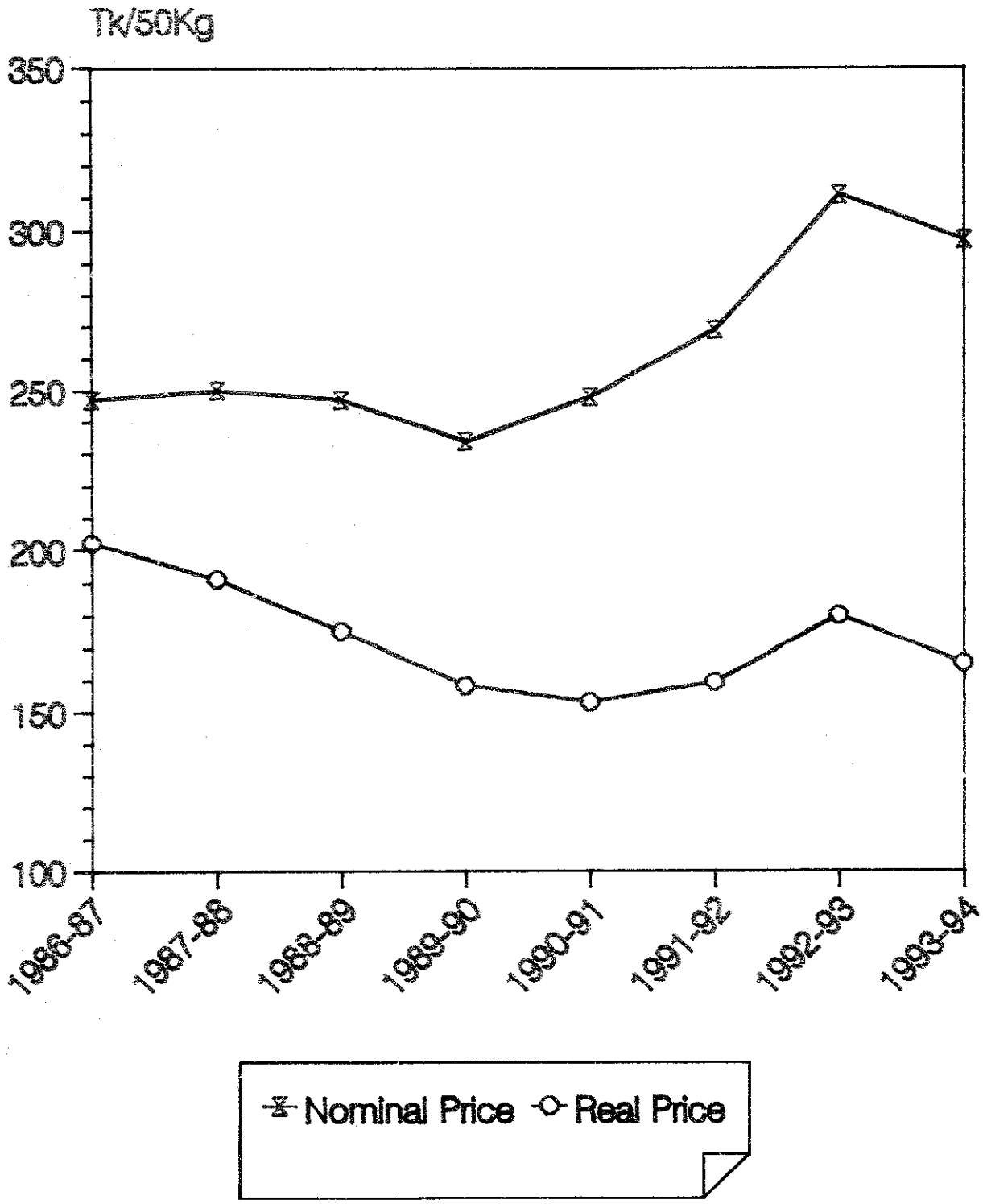


Figure 3.4 Trends in Farm-level Nominal and Real Prices of Aggregate Fertilizers from 1986-87 to 1993-94 at 1984-85 Constant Prices



includes the cost incurred by BADC for transporting fertilizer from ports and factories to PDPs (Tk.690) plus the cost incurred by the private dealers in transporting fertilizer from PDPs to farms.

Table 3.7 Fertilizer Distribution Costs as a Percentage of Port and Factory Prices in 1988 and 1993 by Product

Month Product 1	Port and factory prices 2	Issue price at PDPs 3	Farm-level prices 4	Distribution Cost: From ports and factories to PDPs 5	Distribution Cost: From PDP to farm-level (Col. 4-3) 6	Distribution Cost: Total (Col.5+6) or (Col.4-2) 7	Distribution cost as a % of port or factory prices 8
	Tk per MT						%
BEFORE PRIVATIZATION							
June, 1988							
Urea	3,709	4,525	4,921	690	396	1,086	29
TSP	5,900	4,725	5,215	690	490	1,180	20
MP	3,395	3,725	4,313	690	588	1,278	38
July, 1988							
Urea	3,709	4,525	4,952	690	427	1,117	30
TSP	5,900	4,725	5,181	690	456	1,146	19
MP	3,395	3,725	4,425	690	700	1,390	41
August, 1988							
Urea	3,709	4,575	4,942	690	367	1,057	28
TSP	5,900	4,725	5,199	690	474	1,164	20
MP	3,395	3,725	4,542	690	817	1,507	44
AFTER PRIVATIZATION							
June, 1993							
Urea	4,725		5,300			575	12
TSP	6,860		7,980			1,120	16
MP	5,525		7,140			1,615	29
July, 1993							
Urea	4,075		5,040			965	24
TSP	6,860		8,080			1,220	18
MP	5,525		7,100			1,575	29
August, 1993							
Urea	4,075		4,736			661	16
TSP	6,860		8,039			1,179	17
MP	5,525		7,056			1,531	28

Source: BADC and FDI-II

Notes : 1. Urea prices are factory prices and uniform for all factories except CUFL and NGFF where prices were less by Tk.200 and 400 per MT, respectively, in June 1993. Prices at NGFF was less by Tk.200 in August, 1993.
2. Port prices of TSP and MP during 1988 are the cost per MT of the product incurred by BADC importation.
3. The prices of TSP in 1993 are weighted averages by quantity imported and procured from factories.
4. Percentages are rounded.

As indicated in **Table 3.7**, between June-August, 1988 before privatization, the actual cost of distribution of urea from the factories to the farm-level ranged from 28% to 30% of the factory prices (Tk.1,057 - 1,117 per MT). By June-August, 1993, the urea distribution cost as a share of ex-factory prices decreased to 12-16%, excluding an abnormal period in July, 1993 when BCIC reduced the price of urea from Tk.4,725 to 4,075 per MT.

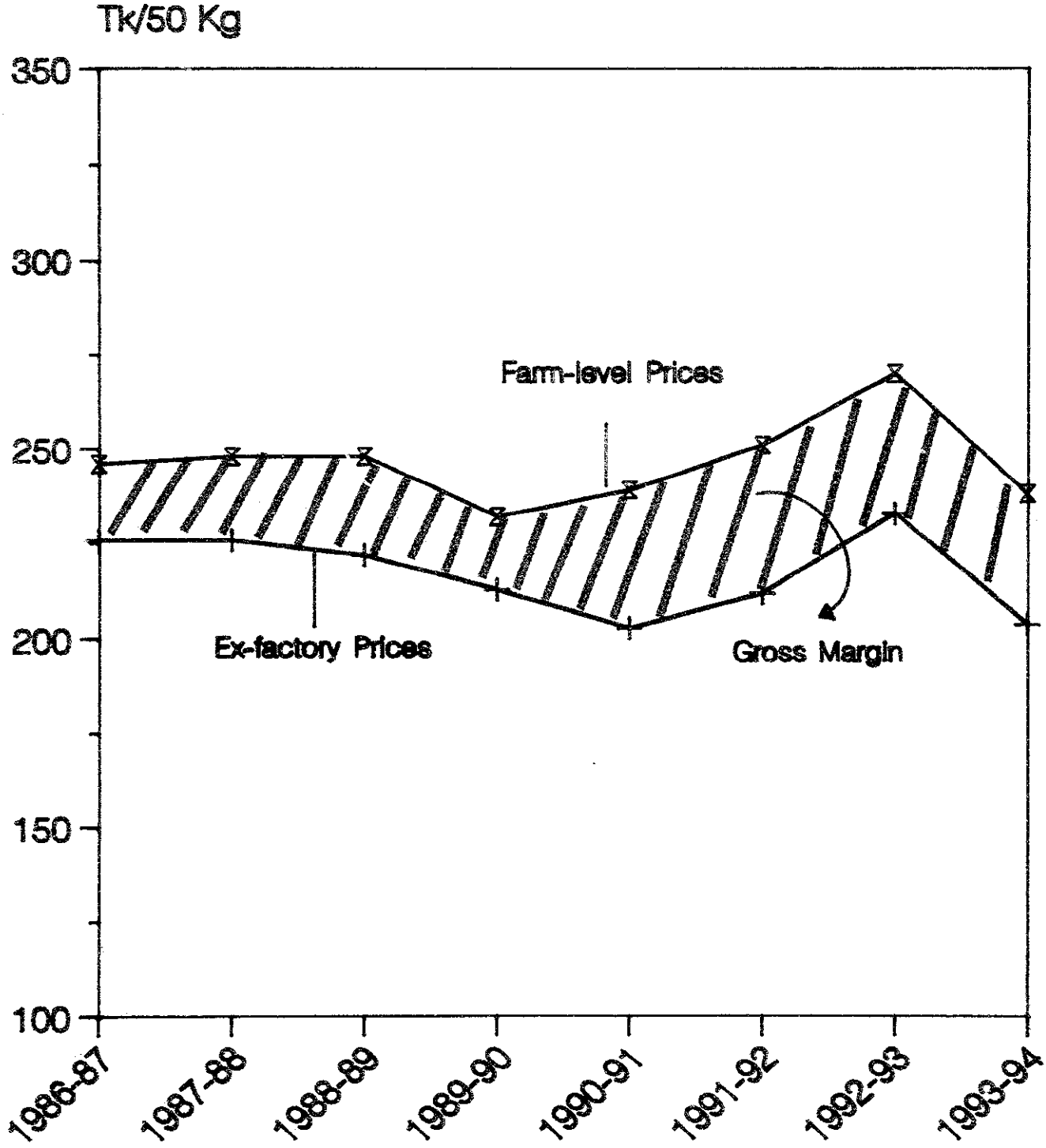
The case with TSP and MP is similar. The range of distribution costs for TSP decreased to 16-18% of the port and factory prices in June-August 1993. It was 19-20% before privatization. For MP, the range of distribution costs decreased from 38-44% of the port price before privatization to 28-29% in June-August, 1993.

If the inflation factor is considered, then the share of distribution costs of the private sector should have increased rather than decreased. This clearly shows that private sector is performing efficiently in fertilizer marketing. The margins that are now being realized by private distributors are much lower than they were in 1988. Therefore, it is clear that despite inflationary pressure from such factors as higher fuel prices, the private sector is successful in keeping the costs of fertilizer distribution lower than expected in the public sector.

The gross margins of the private dealers did not increase significantly after subsidy withdrawal. The gross margin which shows the difference between the ex-factory price and the farm-level prices of urea between 1986-1987 and 1993-1994 have remained relatively constant (**Figure 3.5**). On average, the gross margins for the last four years from 1990-1991 to 1993-1994 ranged between 16% and 19%. The fact that gross margins have demonstrated a stable pattern is significant because a number of distributors are incurring increased costs in such areas as sponsorship of dealer development training programs, publication of technical literature on fertilizer use, and conducting farm-level demonstrations to improve the knowledge of farmers about fertilizer use. Investment by the private sector in such services complements the work of DAE and is fully consistent with the policy reforms of BDG.

Availability of fertilizer has been satisfactory. The fertilizer marketing system includes an extensive network of distributors, wholesalers, dealers, retailers that cover the entire country, except for the 3 small districts in the Chittagong Hill Tracts. As a result, fertilizer availability in Bangladesh has improved significantly. Stability in farm-level prices, except in times of occasional and short lived shortages with sharp increases in sales is a clear indication of improved availability and intense competition in the private sector. The improved availability of fertilizer in rural Bangladesh is further evident from FDI-II monitoring which shows that in 1986 about 41% of the Bangladeshi farmers were able to purchase fertilizer at retail shops within 5 kilometers of their farms but in 1994 that percentage improved significantly to 80%.

Figure 3.5 Trends in Gross Margins for Urea Sales From 1986-87 to 1993-94



Private distributors maintain fertilizer stocks according to demand. Fertilizer distributors have demonstrated an ability to manage inventories in such a way as to maintain a fair balance between inventory storage costs and the cost of lost sales due to stock shortages. Fertilizer distributors are behaving rationally according to expected market norms and increase stocks during the peak seasons but maintain a relatively low stock during the lean seasons. The inventories of the private sector vis-a-vis the public sector during the life of FDI-II are shown in **Table 3.8**.

Table 3.8 Inventories of All Fertilizers in Public and Private Sectors by Month from 1987-1988 to 1993-1994

Fiscal year	Sector	July	August	September	October	November	December	January	February	March	April	May	June
		'000' MT											
1987-1988	Public	638	651	629	629	583	502	467	325	271	402	458	577
1988-1989	Public	594	627	616	637	657	612	549	469	442	491	616	645
1989-1990	Public	663	723	665	679	642	670	611	521	460	515	555	531
1990-1991	Public	440	362	257	312	324	306	311	246	218	255	231	242
1991-1992	Public	151	109	112	100	111	144	238	165	195	286	321	299
1992-1993	Public	260	196	174	211	365	389	363	285	239	290	394	497
	Private					255	281	343	253	192	209	186	152
1993-1994	Public	440	385	387	441	405	317	246	216	285	420	559	588
	Private	127	118	121	149	143	165	202	173	163	157	182	115

Source: BADC Fertilizer Newsletter, BCIC daily reports, and FDI-II

Notes: 1. Figures are rounded.
2. IFDC started collecting data on private sector fertilizer stock in November, 1992.
3. Stock is shown as of the last day of each month.

Production and sales from BCIC factories increased. With greater participation of the private sector in the procurement of fertilizer direct from factories, production in all fertilizer factories, except the Natural Gas Fertilizer Factory (NGFF) and the Chittagong TSP Complex (CTSPC), increased considerably (**Table 3.9**). NGFF is a very old factory and is considered redundant. IFDC proposed to close this factory in January, 1993, but due to resistance from the factory employees and political pressure from the local leaders no action has been taken. IFDC also recommended closure of the CTSP factory due to the poor condition of the factory and high cost of production.

The increased sales of urea from the BCIC factories from 1989-1990 to the private distributors complimented the increased domestic production (**Figure 3.6**). The cash flow of BCIC has improved dramatically as private sector payments are made in cash or through confirmed bank financing. Payment from BADC was always delayed and when direct

procurement from the factories by the private sector was allowed during March, 1989, BCIC was to receive an amount of about Tk.1.2 billion from BADC for procuring fertilizer from factories. According to BCIC, with the involvement of direct procurement by the private sector, profits from all BCIC factories, except NGFF increased considerably. BCIC estimates that the total profit of all fertilizer factories increased from Tk.695 million in 1988-1989 to Tk.990 million in 1992-1993, thus an increase of about 42%.

Table 3.9 Production of Fertilizers by BCIC Factories from 1986-1987 to 1993-1994

Fiscal year	CUFL	JFCL	ZFCL	UFFL	PUFF	NGFF	Total	CTSPC	
	Urea							TSP	SSP
	'000' MT								
1986-1987			337	318	80	112	846	137	
1987-1988	281		494	312	95	104	1,286	135	
1988-1989	411		451	378	106	98	1,443	143	
1989-1990	567		447	271	90	97	1,472	146	
1990-1991	494		454	264	107	101	1,420	96	15
1991-1992	579	173	475	194	119	100	1,640	91	45
1992-1993	410	478	529	291	114	87	1,909	48	111
1993-1994	555	566	496	381	100	86	2,184	68	108
% change 1986-1994	98	221	47	20	25	-23	158	-50	620

Source: BCIC reports
Notes : 1. In case of urea from JFCL and SSP from CTSPC, percentage change is shown for 1991-1994 and 1990-1994, respectively.
2. Figures are rounded.

The knowledge of BCIC is largely limited to manufacturing. Previously it had a captive buyer in BADC, and therefore, was not disposed to improve marketing techniques. With the introduction of private sector procurement, BCIC is now considering sound commercial techniques with the assistance from FDI-II. However, constraints in the delivery system of factories during the peak demand months have caused upward pressure in the farm-level prices. One of the major issues regarding BCIC's delivery system is that during the peak demand months, daily supply is almost 50% of the daily demand. This creates upward pressure in the farm-level prices of urea during the peak months as observed over the last 8 years (**Figure 3.7**).

In contrast, during the low demand months, sales fall far below daily production and factory warehouses are soon filled to capacity and the factory is either forced to close or make distress export sales to clear the inventory. Neither of these situations are desirable. To overcome this problem, IFDC recommended that BCIC adopt a variable pricing policy to change the domestic sales pattern. This will mean more sales in the lean months and less

Figure 3.6 Urea Production and Sales from BCIC Factories from 1986-87 to 1993-94

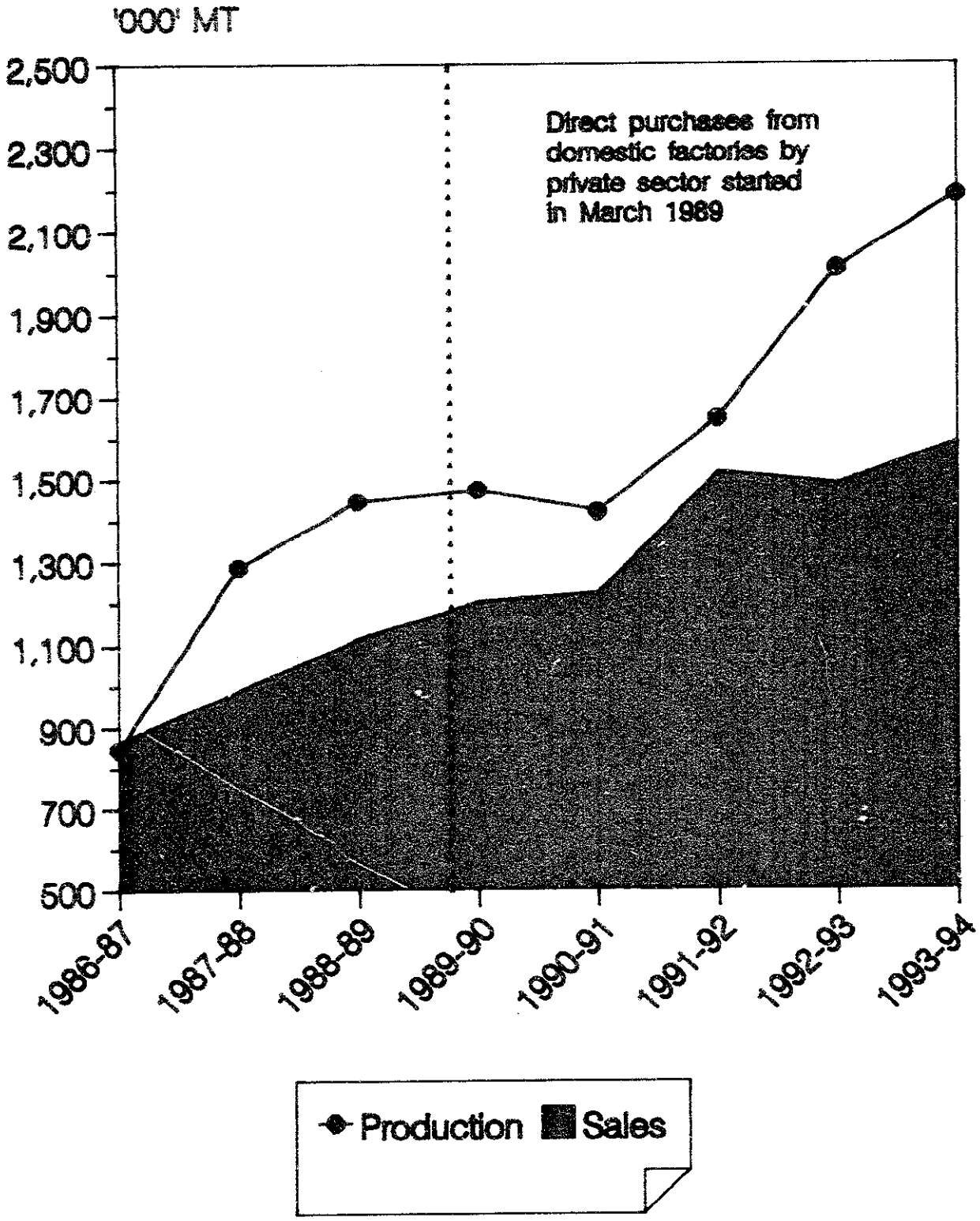
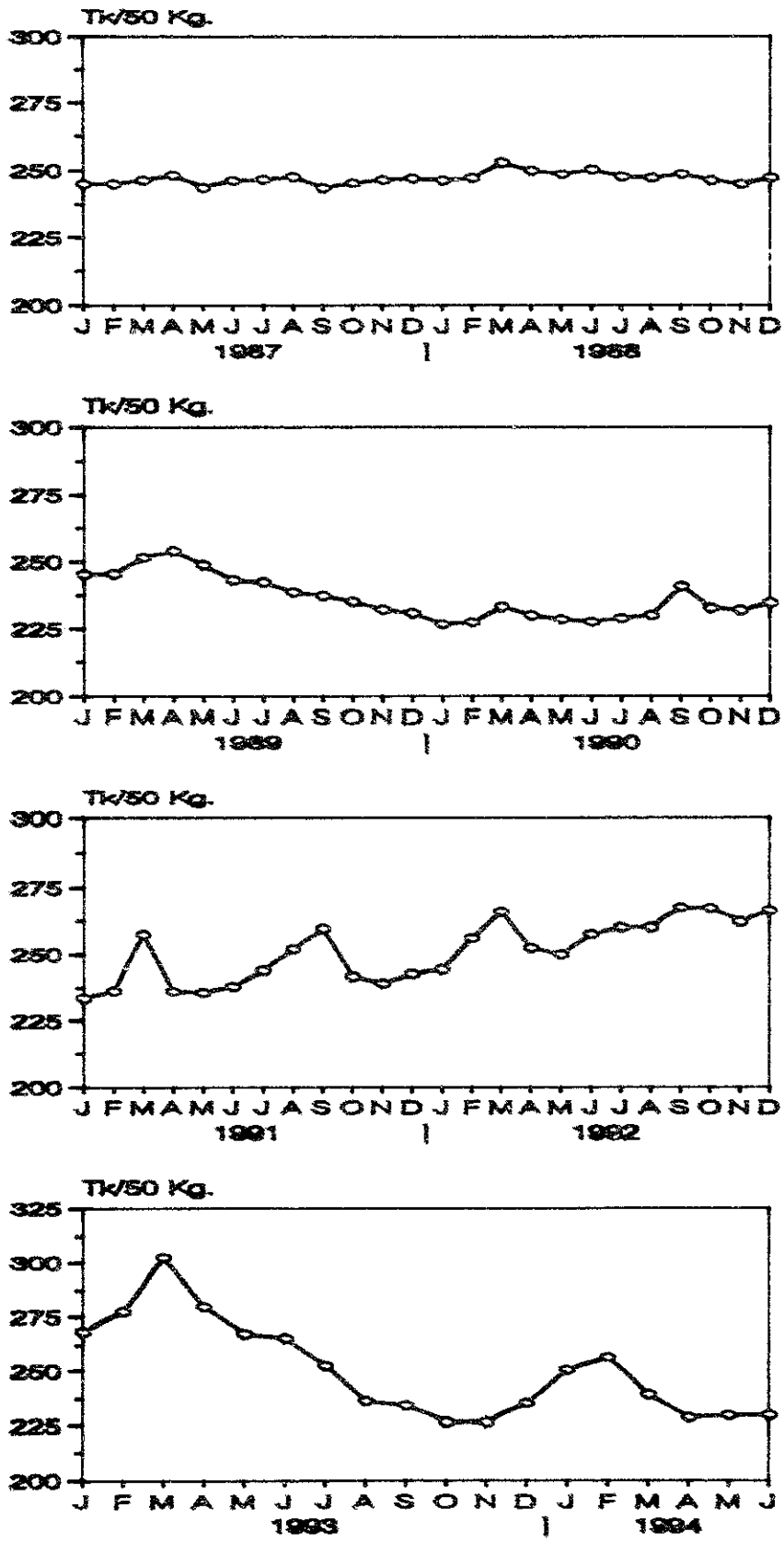


Figure 3.7 Farm-level prices of Urea by Month from 1987 to 1994



pressure on the factories to supply the domestic market during the peak demand months. This will enable BCIC to maintain a relative stable rate of selling throughout the year. This will shift the storage function to the private distributors which will result in improved supply and availability of urea at the farm-level. It is estimated that BCIC would save about Tk.13 million on inventory costs by a variable pricing policy.

Fertilizer Sales Increased Dramatically. The logical framework in the FDI-II project paper included an output of achieving an annual growth of at least 8% in aggregate fertilizer consumption over the life of project. The trend in fertilizer sales between 1986-1987 and 1993-1994 is shown in **Figure 3.8**. Aggregate fertilizer sales from 1986-1987 to 1993-1994 increased by about 70% with an annual compound growth rate of about 8%. Fertilizer sales by product and nutrient, respectively, for the last 8 years are shown in **Tables 3.10 and 3.11**. During the 1st three years of implementation of FDI-II (from 1987-1988 through 1989-1990) fertilizer sales increased by an average of about 240,000 MT per year, more than three times the previous three years average increase of 65,000 MT per year. The growth in fertilizer sales slowed from 1990-1991.

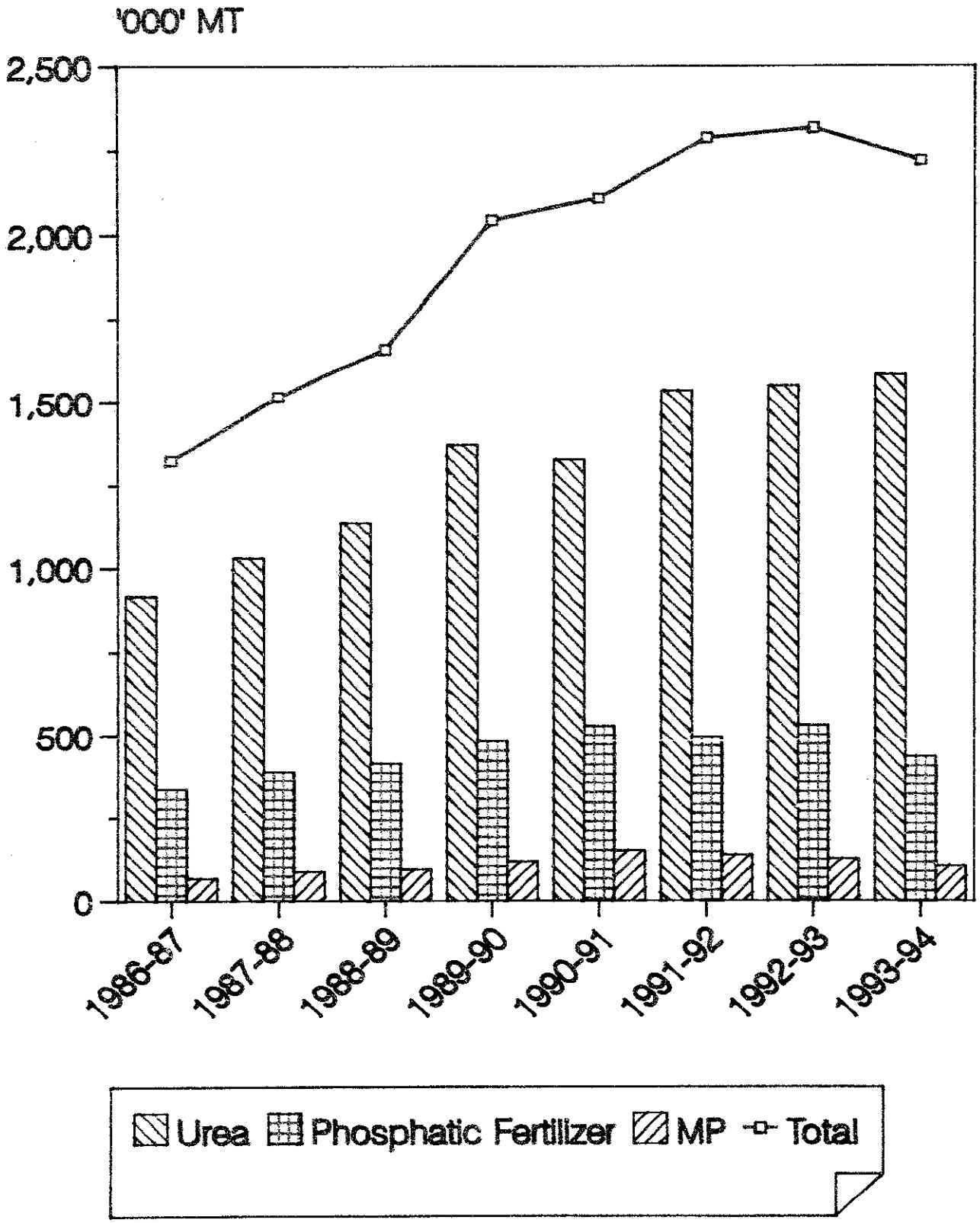
Table 3.10 Fertilizer Sales by Product and Year from 1986-1987 to 1993-1994

Fiscal year	Product							
	Urea	Phosphatic fertilizer	MP	Gypsum	Zinc	ASP	Other	Total
	MT							
1986-1987	915,019	335,659	65,850	2,824	1,353		238	1,321,243
1987-1988	1,029,077	390,159	86,139	1,390	1,630	6,796		1,515,191
1988-1989	1,135,062	415,993	94,172	10,745	2,800	93	173	1,659,038
1989-1990	1,369,237	480,489	118,663	67,808	5,180	1,785	18	2,043,180
1990-1991	1,323,397	526,912	149,761	101,782	2,743	2,763	211	2,107,569
1991-1992	1,533,481	492,873	137,135	115,334	3,805	4,797		2,287,425
1992-1993	1,547,407	528,840	126,083	108,140	722	4,992		2,316,184
1993-1994	1,578,955	433,468	103,875	86,051	5,200	10,036	97	2,217,682
Annual compound growth rate (%)	8	4	7	62	21	7		8

Source: BADC Fertilizer Newsletter and FDI-II
Notes : 1. Phosphatic fertilizers include TSP, SSP, and DAP.
2. Base year is 1986-1987 and percentages are rounded.

Several factors contributed to this including a doubling of the price of diesel fuel, and therefore, an increase in the cost of irrigation. As a result, the irrigated area remained virtually constant. An artificial shortage of urea because of untimely export by BCIC also led to a slight increase in urea sales during 1992-1993. Sales were also disrupted with the increase in the

Figure 3.8 Fertilizer Sales from 1986-87 to 1993-94 by Product



prices of TSP and MP after complete withdrawal of the subsidy. A significant decrease in food grain prices in 1993 may also be partly related to weak demand. Moreover, slow growth in HYV acreage, specially during Aus season between 1990 and 1994 also impeded faster growth of fertilizer. Between 1990-1991 and 1992-1993 HYV area of paddy increased by 495,000 hectares compared to 733,000 hectares between 1988-1989 and 1990-1991. Although aggregate sales increased at an annual compound rate of about 8%, naturally all products did not increase at the same rate. Data in **Table 3.10** show that sale of major fertilizer products such as urea increased by an annual compound rate of 8%, phosphatic fertilizers (TSP, SSP and DAP) by 4%, and MP sales increased by 7% from 1986-1987 to 1993-1994.

Table 3.11 Fertilizer Sales by Nutrient and Year from 1986-1987 to 1993-1994

Fiscal year	Nutrient: Nitrogen (N)	Phosphorous Pentoxide (P_2O_5)	Potassium Oxide (K_2O)	Sulfur (S)	Zinc (Zn)
	MT				
1986-1987	420,909	154,403	39,510	752	487
1987-1988	474,802	179,490	51,683	2,174	587
1988-1989	522,179	191,357	56,503	11,460	1,008
1989-1990	630,225	220,718	71,198	13,651	1,865
1990-1991	609,949	238,986	89,857	20,932	987
1991-1992	706,408	216,585	82,281	26,940	1,370
1992-1993	713,217	209,715	75,650	35,172	260
1993-1994	733,589	151,626	62,325	39,306	1,873
Annual compound growth rate (%)	8	(-)	7	76	21

Source: Calculated from Table 3.10

Notes : 1. The nutrient content of various fertilizers are: Urea= 46% N, TSP= 46% P_2O_5, DAP = 18% N and 46% P_2O_5, SSP= 18% P_2O_5 and 12% S, MP= 60% K_2O. Gypsum= 18% S, ASP= 21% N and 24% S, Zinc= 18% S and 36% Zn.

2. Percentages are rounded and (-) indicates less than 1%.

The annual growth rate in terms of nutrient sales shows that nitrogen (N) during the same period increased by an annual compound rate of 8% and potash (K_2O) by 7%. Sales of phosphorous virtually remained the same during this period. The sale of phosphorus is comparatively low because of the low nutrient content of SSP, which farmers are using as

an apparent substitute for TSP[4]. Another important reason for low sales of P_2O_5 is the complete withdrawal of subsidy from TSP, the major phosphatic product. This is also the case for MP. The situation was further aggravated by the decision of BDG to reduce prices of urea within 6 months of the complete withdrawal of subsidy from TSP and MP. This was not a favorable development for farmers with regard to price ratios between agricultural output (HYV paddy) and phosphorus and potash vis-a-vis price ratios between HYV paddy and nitrogen fertilizer. As shown in **Figure 3.9**, during the Boro season of 1989-1990, farmers needed 0.8 kg, 0.9 kg and 0.7 kg of HYV paddy, respectively, to purchase 1 kg each of urea, TSP and MP. This ratio did not change for urea, but increased to 1.4 kg for purchasing 1 kg each of TSP and MP during the Boro season of 1994.

Despite the progress made in the fertilizer sector, a slight increase in the farm-level price of fertilizer during occasional and short lived shortages concerns policy makers. Fertilizer constitutes 9% to 15% of the total cost of production of HYV Boro, which accounts for the major consumption of fertilizer (**Figure 3.10**).

Farmers are using fertilizer in diversified crops. Bangladesh farmers are receptive to technological improvements provided their socio-economic conditions permit. Realizing the benefits of fertilizers, farmers are inclined to use fertilizer in diversified crops. The share of total fertilizer use for paddy decreased from 86% in 1981-1982 to 76% in 1990-1991. The share increased from 3% to 7% for wheat, 1% to 4% for potato, 3% to 4% for oilseeds, and nil to 1% for vegetables between 1981-1982 and 1990-1991 (**Figure 3.11**). There is considerable interest in crop diversification in Bangladesh and it is expected that with the gradual shifting of land towards diversified crops, fertilizer use in these crops will continue to increase.

Bangladesh Fertilizer Association - a key factor in the institutionalization of private sector fertilizer marketing. All domestic fertilizer distribution and marketing activities are now under private sector management. FDI-II acted as a catalyst in the fertilizer market reform process. Working in close collaboration with the Ministry of Agriculture, IFDC has attempted to represent the concerns and interests of the BDG, the fertilizer distributors, merchants and traders, various donors and most importantly the farmers of Bangladesh. It is now time for the fertilizer dealers in Bangladesh to begin to develop their own capability to deal with certain key issues, for example, market monitoring and intelligence, liaison with the government on fertilizer and agriculture related issues, dealer training and technology transfer, and dealer or retailer and farmer education about fertilizer use. A well organized fertilizer association can be an effective force for developing those important capabilities and representing the mutual interests of the fertilizer sector on many critical issues related to continued fertilizer development and improved marketing. With this aim in view, the Bangladesh Fertilizer Association (BFA) was formed. This is a concrete outcome of the FDI-II technical assistance. FDI-II provided technical support and organizational assistance in the planning and subsequent formation of the BFA.

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[4] SSP contains 18% P_2O_5 and 12% S, and TSP contains 46% P_2O_5.

Figure 3.9 Kg of HYV Paddy Needed to Purchase 1 Kg of Fertilizer

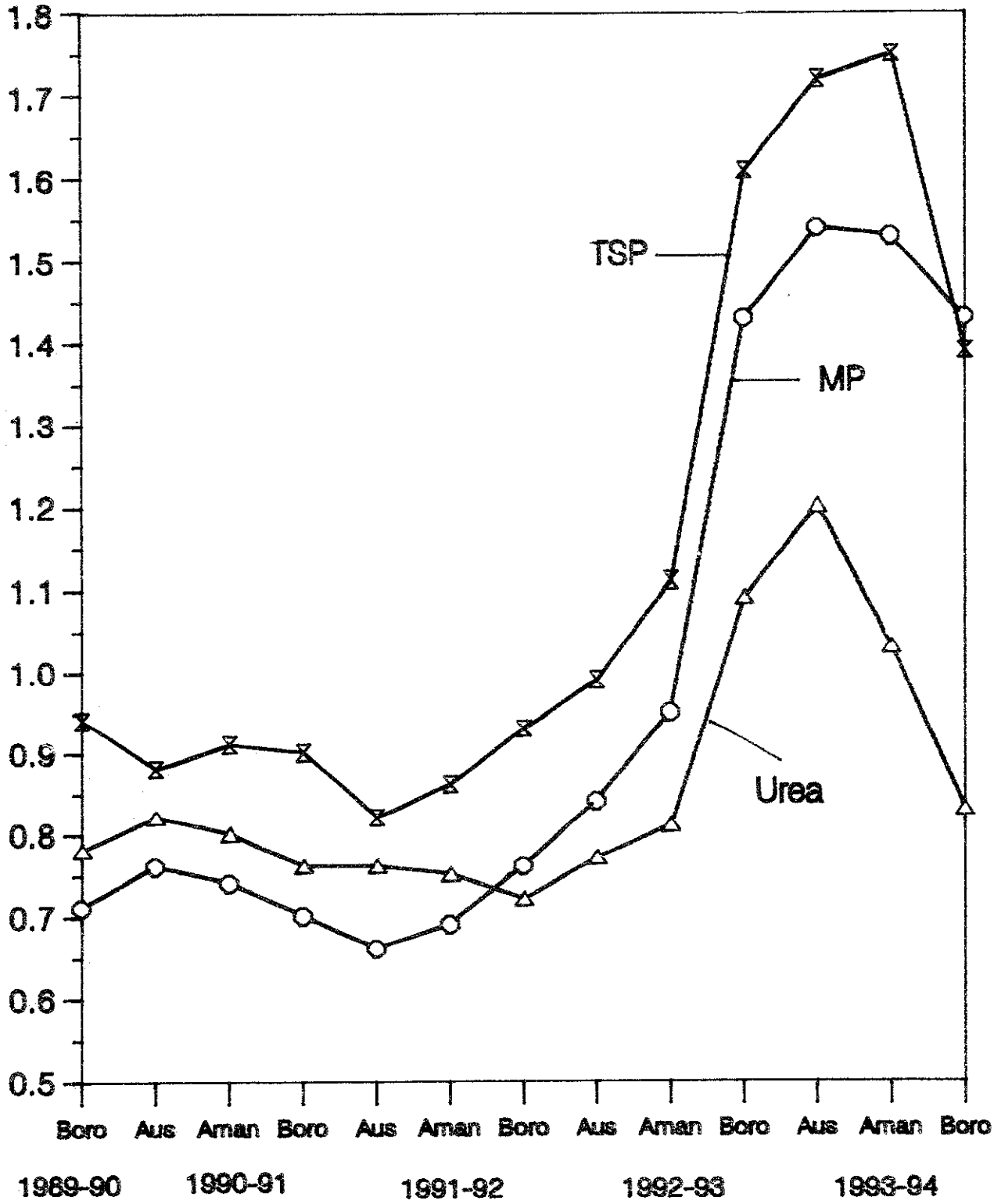


Figure 3.10 Factor Share of Cost of HYV Boro Cultivation Per Acre of Land

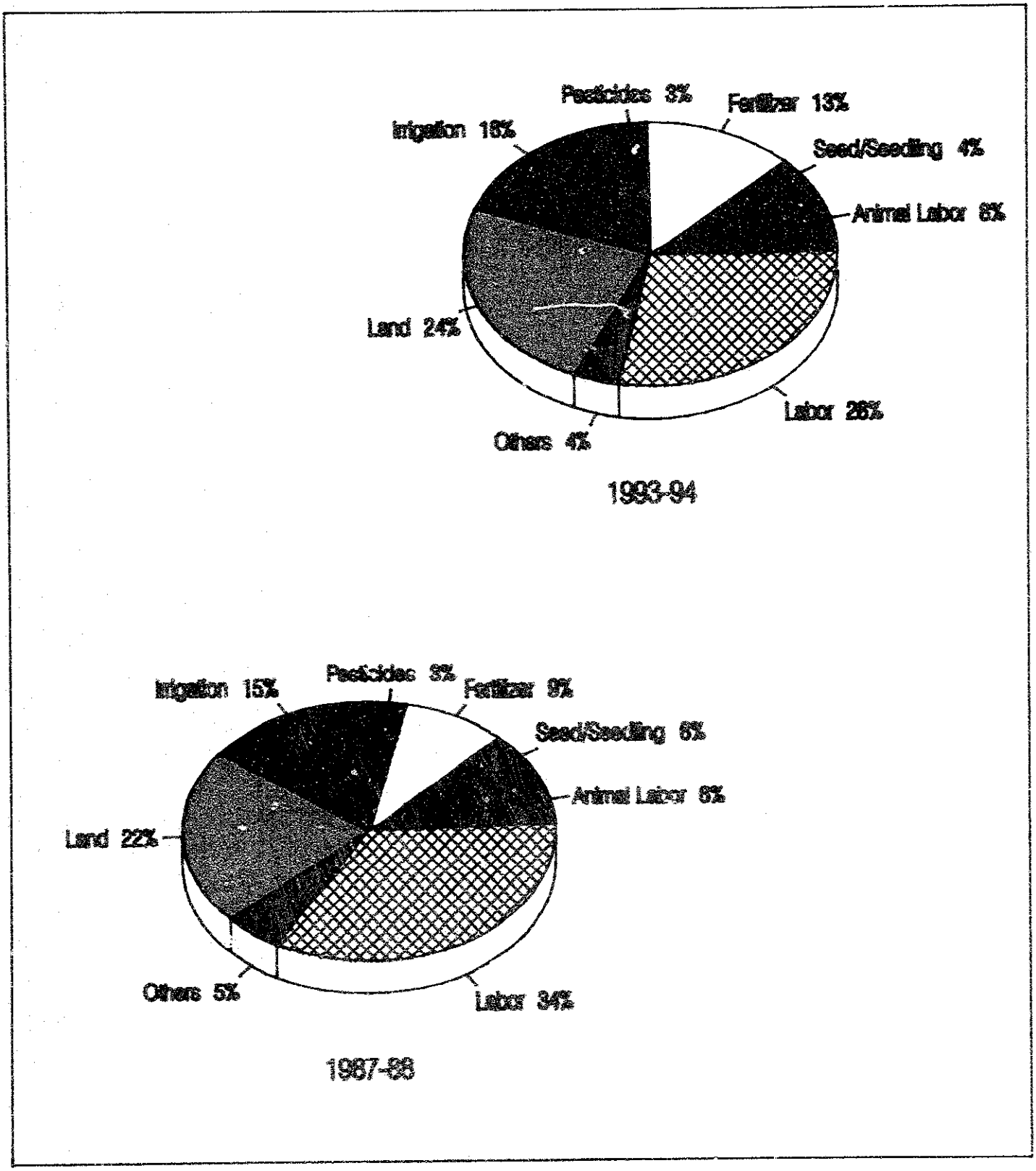
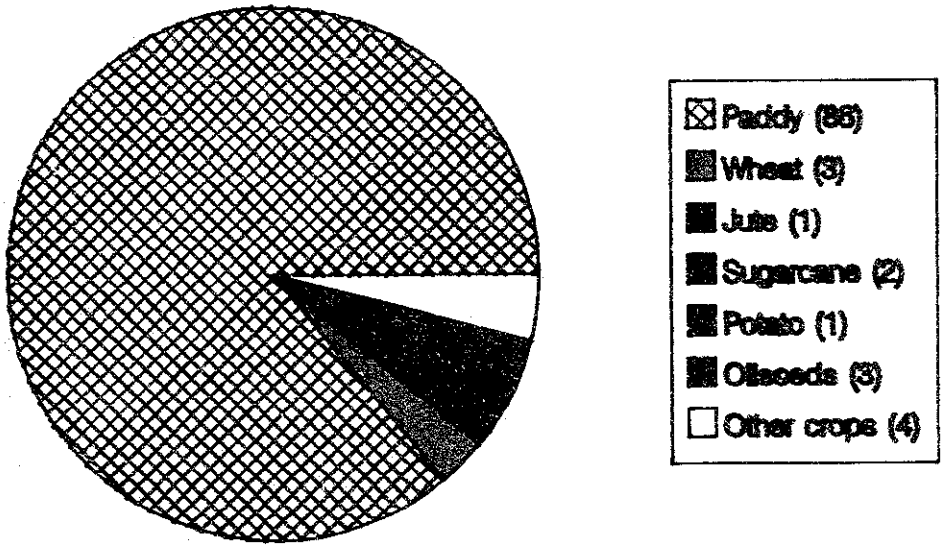
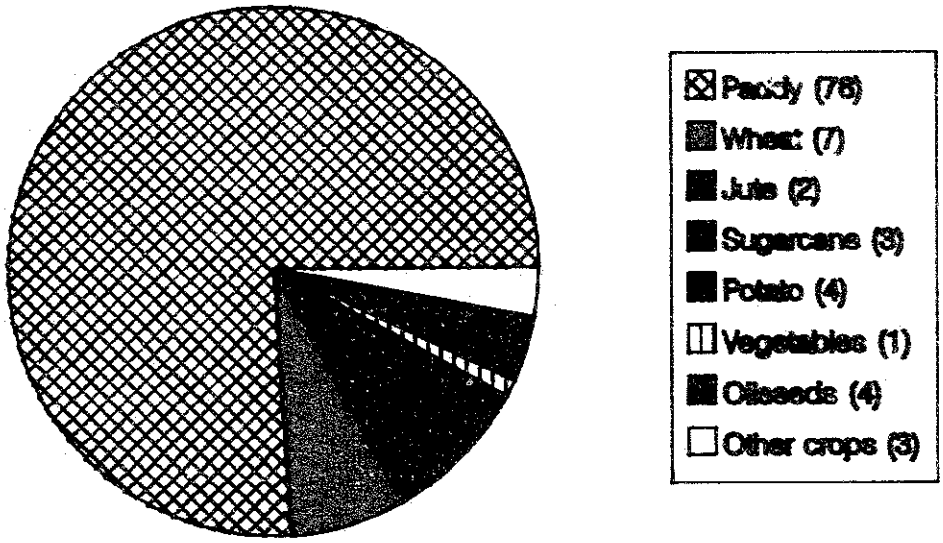


Figure 3.11 Percentage Share of Fertilizer Nutrient Use by Crop, 1981-91



1981-82



1990-91

The Fertilizer (Control) Order is essential to protect the interests of farmers. All fertilizer marketing activities including import, and distribution are managed by the private sector in Bangladesh. Although Bangladesh has an Essential Commodities Act to protect the interests of consumers, it is difficult to ensure quality of fertilizers under this act. Therefore, measures were required to regulate quality of fertilizers in the interest of consumers, farmers, and traders. With this in mind, a draft fertilizer (control) order was prepared through FDI-II to promote the distribution of effective and safe fertilizers and provide assurances that fertilizers are identified properly. This regulation also provides assurance of the validity of the quality and quantity represented by manufacturers. Enactment of the fertilizer (control) order is under consideration of the BDG.

Credit Program

Access to credit is essential to facilitate the privatization of fertilizer distribution. With the gradual transformation of the fertilizer business from the public sector to the private sector, demand for credit from institutional sources increased to meet the need for working capital among fertilizer dealers and distributors. No specific bank credit program for fertilizer marketing was available, although many dealers borrowed from banks for fertilizer purchases. But with greater participation of private sector distributors in the fertilizer business, lack of funds and the high cost of borrowing from institutional sources became constraints to many fertilizer distributors to expanding fertilizer business activities. A key component of FDI-II was to provide technical assistance to improve and strengthen the capabilities of banks in providing funds to finance a fertilizer dealer credit program and fertilizer imports. The main objectives of the FDI-II credit program were to:

- Promote the access of distributors to funds through the commercial banking system which is essential for:
  - inventory maintenance
  - trade credit to dealers, retailers and ultimately, farmers
  - increasing flexibility of distributors and dealers in using different sources of financing for technology transfer activities.

The In-Kind Credit Program

During the early stages of developing private sector dealers and operations, an in-kind credit program managed by BADC was funded under FDI-II. Of a U.S.$ 13 million soft loan for in-kind credit, USAID released U.S.$ 3 million in April, 1989 to BADC for the program at PDPs and later the TDPs. With the rapid transition of the domestic fertilizer market from the public to the private sector, the share of BADC in the fertilizer market declined substantially. Many PDPs closed and the demand for the in-kind credit declined

and use of credit funds was slow. Further, with the removal of restrictions on private sector imports of fertilizer, demand for in-kind credit virtually disappeared. After a review by FDI-II, the remaining amount of about U.S.$ 10 million for the in-kind credit program was de-obligated and used for fertilizer imports.

The Commercial Credit Program

The commercial credit program (CCP) was designed to increase availability of institutional credit exclusively for financing fertilizer marketing activities. The objective was to support the central bank in refinance activities for expanding and developing a national fertilizer marketing and distribution system that may generate counterpart funds. Through this program, Bangladesh Bank released funds to participating banks (PBs) on receipt of a letter of request from the PBs for refinance after sanction of credit to fertilizer dealers.

The CCP Fund: The CCP started in June, 1989 through FDI-II. The funds for the program were placed with the Bangladesh Bank in three tranches amounting to U.S.$ 5 million, U.S.$ 7 million, and U.S.$ 3 million released on June, 1989, May, 1990 and December, 1990, respectively. Later, counterpart funds of U.S.$ 6 million were received for four consignments of imported TSP funded by USAID and deposited with the Bangladesh Bank. The total CCP funding as of June 30, 1994 was about Tk.1,053 million or U.S.$ 26 million, which includes original grant funds, counterpart taka funds deposited against import of fertilizer and the interest earned on refinanced loans. Besides the FDI-II funds, the participating banks are using their own funds for loans.

The CCP fund was useful in increasing the availability of credit from banks for private distributors and dealers for financing fertilizer purchases. This, of course, resulted in increased competition in the fertilizer market and improved availability of fertilizer on a timely basis. Initially, 14 banks agreed to participate in the CCP and follow the procedures developed by FDI-II for extending credit to fertilizer distributors and dealers.

There are currently 13 PBs extending credit to the fertilizer sector, or nearly one half of all commercial banks in Bangladesh. Despite a small decline in the number of PBs, down from 15 during 1991-1992 to 13 in 1993-1994 (**Table 3.12**), the number of bank branches extending credit increased from 165 to 395 between 1989-1990 and 1993-1994, thus an increase of about 139%. As indicated in **Table 3.12**, the loan amount sanctioned and disbursed by the participating banks increased from Tk.342 million (U.S.$ 8.6 million) in 1989-1990 to Tk.6,189 million (U.S.$ 154.7 million) in 1992-1993, an increase of about 1,800%. The number of loan applications approved also increased from 165 to 1,198 between 1989-90 and 1993-1994.

Table 3.12 Performance Indicators of the Commercial Credit Program 1989-1994

Indicators	1989-1990	1990-1991	1991-1992	1992-1993	1993-1994	% change 1989-1994
Number of participating banks extended credit	14	14	15	13	13	
Number of branches of PBs extended credit	165	265	331	384	395	139
Loan applications approved	313	465	841	1,062	1,198	283
Loan amounts sanctioned (million Tk.)	342	1,090	5,521	6,189	2,430	610
USAID financed share (million Tk.)	267	576	1,748	1,557	1,004	276
%	78	53	32	25	41	
Participating banks financed share (million Tk.)	75	514	3,773	4,632	1,426	1,800
%	22	47	78	75	59	

Source: Bangladesh Bank and Head Offices of participating banks
Note : The 1993-1994 figures are as of May, 1994 and percentages are rounded.

The funds provided by USAID account for the major share of the total CCP funds during the first two years of the program. That share began decreasing in 1990-1991 and the percentage of the USAID funds that was idle averaged 59% as of May, 1994 compared to 22% in 1989-1990. The reasons for the decrease in the use of CCP funds may be attributed to the following:

- At present, there does not appear to be a liquidity shortage in loanable funds in the banks. Therefore, there is a low demand for the CCP funds of FDI-II. Sufficient liquidity was engendered by a decrease in investment opportunities in most sectors of the economy because of the general economic slow down, emphasis on savings mobilization by PBs, low reserve requirements (reserve requirements fell from 25% to 20% at the end of fiscal year 1992), and relatively less attractive investment in the government sector.

- It appears that there was a mismatch between the short-term PB borrowing from the CCPF (three months) and the sanction of loans (lines of credit) with a longer maturity period to fertilizer traders.

- The capacity of the PBs to make good loans may also have been over estimated. The limited capacity to make good loans has effectively constrained the demand of PB's for outside funding. The effective demand for fertilizer loans is satisfied by local resources, especially in the present environment where greater accountability from bank is expected. It is important to note that, although the financial performance of the PBs in making good loans to the fertilizer sector is not good, it is significantly better (24%) than other sectors of the economy. For example, the delinquency of loans for food grain traders is about 80%.

- The CCP, by providing working capital to the fertilizer distributors, helped to multiply their income from the fertilizer business. Thus, reduced dependence on institutional credit.

- Finally, the fertilizer market has not expanded during last three years as vigorously as during 1989-1990 and 1990-1991, because of the effects of lower paddy prices, and higher fertilizer prices due in part, to the removal of the fertilizer subsidy. In addition, slow growth in the HYV and irrigated areas between 1990-1991 and 1993-1994 impeded growth in the fertilizer sector.

The CCP has, to a great extent, met the FDI-II project objective of encouraging financial institutions to provide working capital for fertilizer traders. The performance of each of the participating banks showing the loan amount sanctioned and disbursed by fiscal year from 1989-1990 to 1993-1994 with the current position of their loan portfolio as of May 31, 1994 are shown in **Table 3.13**. The table shows that during the FDI-II, the cumulative loan amount sanctioned and disbursed by participating banks to the fertilizer sector totalled Tk.15,570 million or U.S.$ 389 million. The fact that the banks are using their own funds for about 59% of the loans for fertilizers is clear evidence that the banks consider the private fertilizer sector viable and profitable. This is a key to institutionalization of the credit system in the commercial banking system.

An estimate of Bangladesh Bank shows that the total fertilizer loans overdue in mid 1994 were Tk.360 million (U.S.$ 9 million), the delinquency rate about 24%. Although any delinquency rate is undesirable, the fertilizer loan portfolios of the banks are on average significantly better than other sectors of the economy. For example, the delinquency of loans for food grain traders is about 80%. In the case of USAID CCP funds, the loan portfolio of the Bangladesh Bank shows no delinquency problems.

Trade credit: One of the objectives of the CCP of FDI-II was to encourage fertilizer distributors, wholesalers, and retailers to pass credit on the next level in the market network so credit could be extended to farmers. A study through FDI-II indicated that about 94% of the CCP loan funds are channeled by the PBs directly to distributors, 5% to wholesalers and 1% to retailers during 1992-1993 (**Figure 3.12**). About 12% of the loan amount

disbursed to distributors by PBs is provided in the form of trade credit, to the next level of the marketing chain. As such as 65% of the fertilizer traders who received loans from PBs in turn provided trade credit to their clients. FDI-II estimated that short-term liquidity valued at Tk.33 million (U.S.$ 0.8 million) was channelled to farmers by fertilizer traders through trade credit during 1992-1993. These estimates are based on a survey of 520 fertilizer traders who received loans during FY 1992-1993. If the total number of borrowers (1,062) is taken into consideration, short-term liquidity valued at Tk.66 million (U.S.$ 1.7 million) was provided to farmers by fertilizer dealers through trade credit.

Table 3.13 Comparative Position of Loans Disbursed to Fertilizer Traders by Participating Banks, Loans Outstanding, and Loans Repaid from 1989-1990 to 1993-1994

	1989-1990	1990-1991	1991-1992	1992-1993	1993-1994	1989-1994		As of May 31, 1994					
Participating banks	Loans disbursed	Loans disbursed	Loans disbursed	Loans disbursed	Loans disbursed	Cumulative loans disbursed	Amount of loans repaid (cumulative)	Number of Borrowers	Loans sanctioned	Loans outstanding	Number of overdue accounts	Loans overdue	Delinqoency rates
	Million Tk.												%
NCBs													
Agrani	39	78	401	623	439	1,580	1,365	93	397	215	14	8	4
Janata	29	23	339	461	57	909	843	36	107	66	8	10	15
Sonali	12	22	228	248	89	599	526	123	84	73	22	21	29
Rupali	33	31	1,029	846	198	2,137	1,960	145	253	177	103	141	80
PCBs													
AB Bank	33	140	580	536	43	1,432	1,330	57	148	102	3	4	4
Al-Baraka	55	14	295	5		369	347	12	97	22	2	22	100
The City	14	11	35	274	33	367	343	4	24	24	2	4	17
IFIC	2	30	368	665	176	1,241	1,125	37	171	116			
Islami	0	493	743	668	764	2,505	2,114	142	1910	391	61	100	26
National	43	128	540	529	79	1,319	1,248	37	103	71	7	15	21
Pubali	6	21	221	218	284	750	641	126	191	109	15	12	11
UCBL	19	41	204	597	61	922	889	26	66	33	3	3	9
Uttara	45	56	538	419	204	1,262	1,172	92	158	90	11	20	22
BKB	8	1				9	9						
RAKUB	4	1				5	5						
Total	342	1,090	5,521	6,189	2,427	15,570	14,081	930	3,709	1,489	251	360	24

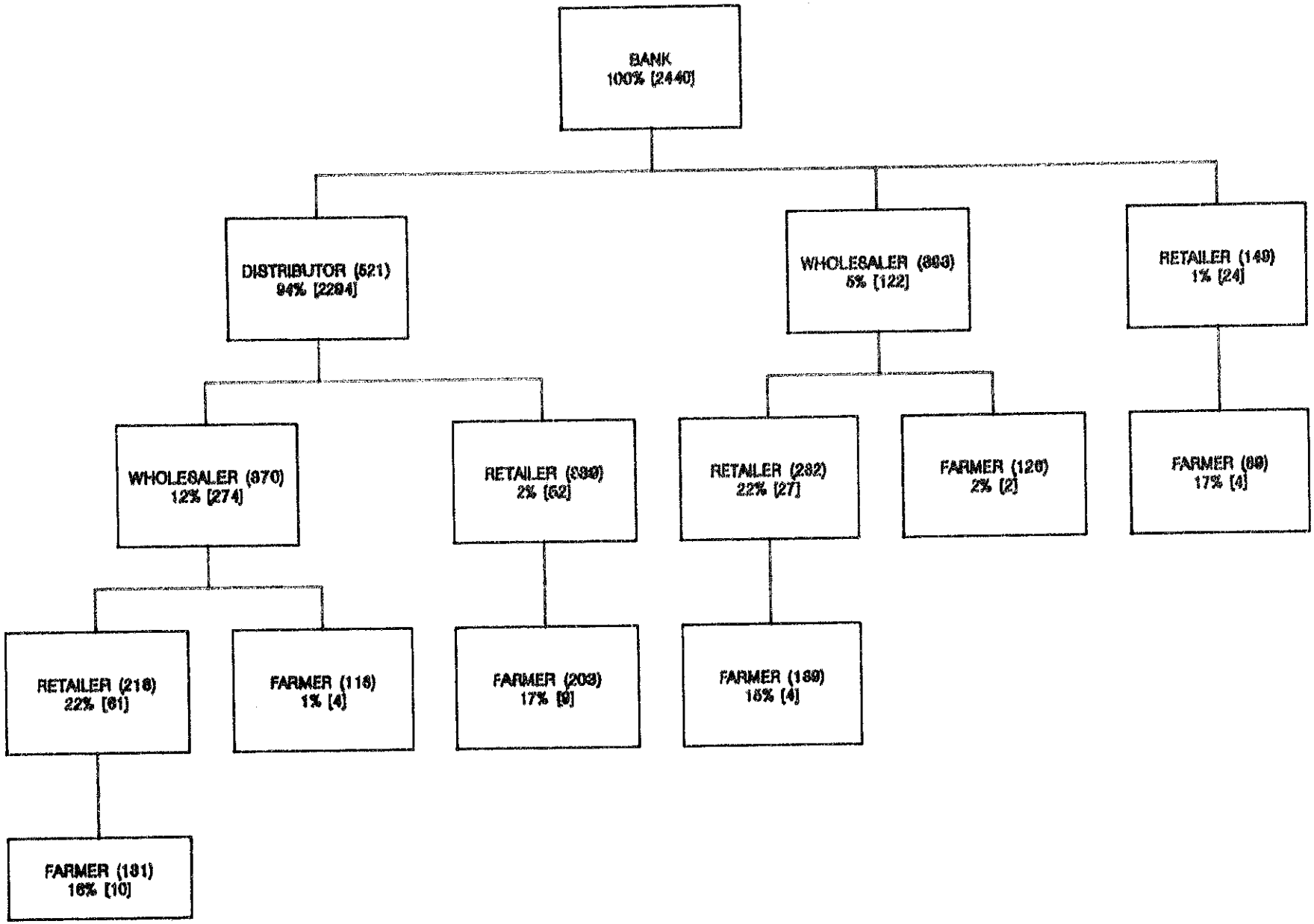
Source: Bangladesh Bank

Notes : 1. 1993-1994 figures are as of May, 1994.
2. Loans sanctioned are assumed disbursed.

The Inland Letter of Credit

When policies to allow direct sales from BCIC factories to the private sector were implemented, the means of payment was cash, initially. With the establishment of the CCP, payments were also made by demand draft (DD) and pay orders (POs). But constraints and risks in arranging cash payments and the use of demand drafts were considerable, especially when fertilizer deliveries were substantially behind pay order requirements. To solve these

Figure 3.12 Trade Credit as of June 1993



Note: ( ) Indicates number.
[ ] Indicates amount in million taka.

(Source: IFDC Credit Survey June 1993
(Surveyed: 520 Borrowers out of 1062

problems, FDI-II proposed another means of payment, the Inland Letter of Credit (ILC) which is similar to a letter of credit and is a legal financial instrument issued by commercial bank to other banks as an agreement to honor, within a specified limit, all bills paid by the receiving bank on behalf of a particular trader.

Payment through ILCs to the factories often involves lower bank charges, alleviates risk, does not block distributors funds with BCIC for prolonged periods, and reduces costs and farm-level prices. The ILC was introduced through FDI-II in 1990-1991 to (1) develop a sufficiently diverse range of financial instruments to allow fertilizer traders to manage effectively their asset-liability portfolios, and (2) alleviate the risk of arranging cash payments. This instrument of payment was accepted enthusiastically by the distributors. The nearly two-fold increase in the number of ILCs issued during 1992-1993 and a major share of procurement of fertilizer through ILCs are indicative of the popularity of this financial instrument (**Table 3.14**). Clearly, the use of ILCs has been a success and contributed significantly to the process of developing a free market for fertilizer in Bangladesh.

Table 3.14 Use of Inland Letters of Credit from 1990-1991 to 1993-1994

Fiscal year	ILCs opened		Fertilizer procured with ILCs	Fertilizer sold through DD, PO, and export	Total BCIC sales	Percent of fertilizer procured through ILCs
	Number	Fertilizer quantity				
		'000' MT				%
1990-1991	56	97	97	1,354	1,451	7
1991-1992	1,512	1,258	1,034	719	1,753	59
1992-1993	2,813	1,232	458	1,293	1,751	26
1993-1994	1,600	914	1,381	978	2,359	59

Source: Fertilizer factories and Head Office of BCIC
Note : Percentages are rounded.

However, the procedure of BCIC maintaining a 2:1 cash to ILC sales ratio that was introduced in 1992-1993 delayed the purchase of fertilizer for as long as three months for those fertilizer traders using ILCs and resulted in a limited use of ILCs. Although BCIC accepts ILCs contracts for as long as 60 days, transactions through ILCs were also impeded because the contracts did not specify a delivery date and there was no penalty to buyers who refused to accept a delivery. This led to an arbitrage opportunity where ILCs were opened by buyers in an effort to maximize profits through strategic positioning in the delivery order sequence. However, this situation improved during 1993-1994. The quantity of fertilizer purchased through ILCs increased from 26% to 59% between 1992-1993 and 1993-1994.

Dealer Development, Training, and Technology Transfer

Dealer Development and Training

A good working knowledge about fertilizers and proper use are essential for dealers to be effective in sales promotion, market development, and offering improved customer services. Educating government officials, fertilizer businessmen, and bankers is also considered essential for creating and maintaining an efficient fertilizer market. To satisfy this need, the dealer development and training program (DD&T) was an important part of technical assistance work through FDI-II.

Initially, FDI-II was involved in advising and assisting BADC in improving DD&T programs that covered a wide range of business development and technology transfer training activities for fertilizer dealers and dealer training officers. With the gradual transition from a public to private fertilizer sector, the dealer development and training programs placed more emphasis on developing private sector importers and distributors, increasing the knowledge and skills of bankers, and improving the knowledge of government policy makers about market economy concepts and management. Based on an assessment of the fertilizer sector and relevant government officials and bankers, a training plan based on need was developed in the first year of FDI-II. This plan was periodically modified to ensure compatibility with overall project objectives. The objectives of the FDI-II training programs were:

- To increase knowledge about fertilizer products and use to enable dealers to provide better services to farmers.

- To strengthen the skills of dealers in fertilizer sales and market development to promote use of fertilizer.

- To enhance fertilizer marketing management skills among dealers as a means to improve efficiency and profitability so that they devote more time and effort to marketing fertilizers.

- To educate policy makers about the benefits of a free competitive marketing system to enable them to identify obstacles impeding development of free and competitive fertilizer market and remove those obstacles, and

- To strengthen the capacities of lending institutions to increase financing for fertilizer trading.

The primary foci of the training programs organized through FDI-II included the following: (1) impact of policy reforms, (2) improving fertilizer use efficiency, (3) orientation programs for dealers, (4) understanding the crop production technology, (5) fertilizer marketing management for dealers, (6) understanding the commercial credit programs, (7) fertilizer inventory planning, (8) fertilizer importation, (9) fertilizer distribution planning, and (10) production and use of compound fertilizers.

FDI-II organized and conducted 238 domestic training and training-cum-workshops for 11,022 participants as of June, 1994 (**Table 3.15**). Private distributors and importers accounted for 83% of all participants, GOB officials including MOA, Ministry of Food (MOF), BADC, BCIC, Department of Agricultural Extension (DAE), other organizations 7%, bankers 6% and other Non-Government Organizations (NGOs), farmers, and Grameen Krishi Foundation (GKF) accounted for 4%. Numerous technical pamphlets, brochures, posters, slides, and films were produced for the domestic training programs. **Annexes III and IV** describe these materials and are indicative of the material provided to and used by the participants in the training programs.

Table 3.15 Participants in FDI-II Training Programs, 1987-1994

		Affiliations of participants														
Year	Number of programs	Distributors and importers	Bankers	MOA	BCIC	BADC	DAE	TCCA	MOF	Other Ministries and Govt. agencies	GKF	NGO	Chamber of Commerce	Farmers	Other	Total
		Number of participants														
Domestic Training-cum-Workshops																
1987	28	1,204														1,204
1988	21	600				70										670
1989	67	2,376	77			131		113		39						2,736
1990	28	1,053	103	5		74								17	24	1,276
1991	29	1,061	97			45								34		1,237
1992	32	1,231	224		41	7	35		10		74	22		7	85	1,736
1993	21	925	113	3	17		89			5	199	4	6			1,361
1994	12	672	57		56		4					4			9	802
Total	238	9,122	671	8	114	327	128	113	10	44	273	30	6	58	118	11,022
External Training, Seminars, and Study Tours																
1988	2			1		5										6
1989	4	2		2		7										11
1990	5		24	2		2									2	30
1991	5	21	16	3											1	41
1992	5	10	12	7	7										2	38
1993	7	12	17	7	3					2					5	46
1994	5	3		4	6					2					6	21
Total	33	48	69	26	16	14				4					16	193

Source: FDI-II

In addition to domestic training, 193 participants from the public and private sector participated in 33 external training, invitational tours, and study tours. For the external training, candidates are required to pass the ALIGU test arranged by USAID. But a shortage of distributors and dealers qualified in the English language posed problems in sending some distributors for training in the USA. Therefore, a strategy was suggested through FDI-II to send an interpreter who had scored high in ALIGU test to accompany participants. Therefore, virtually all external training programs included an interpreter from FDI-II, IFDC, Dhaka, who helped participants acquire knowledge in their own language. A detailed list of external training programs supported through FDI-II is shown in **Annex V** and summarized in **Table 3.15.**

A study conducted by the crop diversification program of MOA in September, 1992 entitled Dealer Development Survey indicated that the private sector fertilizer distributor network is well established and is able to supply fertilizer throughout Bangladesh. The study also indicated that a majority of the dealers have a fair knowledge about fertilizer products with respect to types and doses required by crops. A majority of the dealers provide instructions on the use of products to their clients on request and some offer advice voluntarily. A majority of the farmers also rate the services offered by the dealers as being satisfactory.

The training programs organized through FDI-II were effective in transferring knowledge to the participants. This has been critical to the development and implementation of appropriate policy reform, improved banking practices, improved efficiency in fertilizer importation and marketing, and improved efficiency in fertilizer use.

The private distributors also changed their behavior towards customers. They are now sharing with farmers the knowledge they gained through training in the FDI-II project. They now know the nutrient deficiency symptoms of crops, fertilizer requirements, doses, timing, and methods of application. The monthly farm-level fertilizer price survey of FDI-II also indicated that private dealers assumed an important role in providing technical advice on fertilizer application (**Table 3.16**).

Dealer training is now organized by the private sector. The private sector dealer development training programs of FDI-II emphasized improvement of dealers' knowledge about marketing management, developing a complete marketing mix, credit management, quality assurance, technology transfer, and implementing marketing plans. Improved knowledge in each of these areas motivated private sector distributors to disseminate knowledge to dealers and farmers.

For this purpose, the private distributors organize training programs by themselves as the best means of transferring their knowledge to the others. During 1993-1994, the private sector sponsored and organized 12 training programs in different locations of Bangladesh in collaboration with FDI-II as indicated in **Annex VI**. This demonstrates the institutionalization of the training and dealer development within the private sector. FDI-II provided some technical and financial support for these programs.

Table 3.16 Sources of Technical Advice Received by Farmers on Fertilizer Use from May, 1993 to June, 1994

Month	Private fertilizer dealers	NGOs	Block supervisors	Model farmers, contract growers, and contact farmers	Demonstration plots	Neighbors	Radio or television	Total respondents
	(%)							Number
May, 1993	68	(-)	11	4	(-)	14	(-)	333
June	63		10	8	2	15	1	230
July	50	(-)	13	11	1	20		231
August	37	1	12	18	2	30	1	259
September	33		11	18	5	32	1	172
October	38	2	10	20	4	26	2	229
November	36	3	26	13	2	22	2	331
December	50	1	17	17	2	17	2	298
January, 1994	43	3	23	18	1	16	1	319
February	46	1	32	12	1	20	(-)	624
March	52	1	22	11	2	19	3	565
April	46	1	20	9	3	19	7	391
May	45		21	10	1	22	2	296
June	47	1	16	9	2	22	5	316

Source: FDI-II
Notes : 1. Percentages are rounded.
2. (-) indicates less than 1%.
3. Some farmers reported more than one source.

Technology Transfer

Although the FDI-II project is designed to promote the private sector fertilizer market, the ultimate beneficiaries of the project are farmers. It is known that Bangladeshi farmers learn about fertilizer from the following primary sources: (1) extension workers, (2) contract farmers, (3) field demonstrations, (4) field training, (5) radio, newspapers and television, and (6) fertilizer dealers. They need to be educated continually about the proper use of fertilizer. Therefore, technology transfer was an essential part of FDI-II.

With a view to improving the judicious use of fertilizer and introducing innovative high yielding crop varieties for increased profit, IFDC used the following major tools for the dissemination of technologies: (1) technology demonstrations through BADC, Department of Agricultural Extension (DAE), NGOs, and the private sector, (2) formal training through field days and farmers' rallies, (3) technical brochures, leaflets, and other promotion materials, and (4) direct technical assistance. FDI-II activities on technology transfer concentrated mainly on the introduction of appropriate fertilizer technologies, improved fertilizer use management, and the introduction of crops suitable to the agroclimatic conditions in Bangladesh. Examples of technologies included in the demonstrations were urea super granules and urea deep placement technology, hybrid maize, baby corn, proper fertilizer management practices for rice and maize, and di-ammonium phosphate (DAP) fertilizer.

Urea Super Granule (USG): IFDC research shows that nitrogen losses from broadcasting urea may be as high as 60%-70% through volatilization, leaching, and run off. That research also shows that placing urea 7-10 cm into paddy soil after transplanting increases production in comparison to split broadcast applications of urea at similar rate. Urea deep placement (UDP) provides greater agronomic efficiency in terms of higher yield and less urea. UDP field results indicate per hectare yields of Aman paddy increased on average by 586 kg and Boro paddy by 891 kg compared to split broadcast application of the same amount of urea in both the plots. Considering the benefits of UDP, FDI-II undertook a UDP demonstration program with BADC in 1988-1989 through FDI-II. Later, Grameen Krishi foundation (GKF), DAE and the private sector were also involved in the program which continued until 1993-1994. During this period, 568 UDP demonstrations and 21 field days were organized and conducted by FDI-II.

Results obtained during FDI-II showed a remarkable agronomic benefit from the use of UDP. The yields of Boro paddy in UDP plots increased on average by 13-19% compared to split broadcast plots. In the case of Aman paddy, yield in UDP plots increased on average by 12-15% compared to split broadcast application of the same amount of urea.

Based upon the excellent field results, this technology offers excellent potential for adoption by farmers. FDI-II proceeded to develop prototype urea briquetting machines and encouraged production of the machines in Bangladesh. Briquette production, marketing, and test marketing began in 1989. Thirteen briquetting machines were locally manufactured through FDI-II. The production capacity of each machine is 200 kg per hour and 1,600 kg per day. Although USG technology appears promising for small-scale rice production in developing countries, much work remains. With diligence, however, the practice of UDP can make a significant contribution to accelerating rice production and satisfying increasing demand.

Maize Cultivation: The agroclimatic conditions in Bangladesh are well suited for maize cultivation. Yet, Bangladesh imports about 90% of the maize consumed annually. Because of the excellent potential for maize production, FDI-II organized a varietal trial program in 1990-1991. This was followed by a demonstration program in 1990-1991 using hybrid and composite varieties through the private sector, NGOs, BADC, and GKF. The demonstration results indicated that maize could be grown in virtually all types of soils in Bangladesh with respectable yields but the yield of hybrid maize was much higher than that of the local composite. For example, field trials under FDI-II demonstrated an average yield of about 8 MT per hectare with hybrid seed. The highest yield, 13 MT per hectare, was obtained with Cargill seed (**Table 3.17**). Based on these field trials, the economics of maize cultivation appeared very attractive. The break-even maize price using hybrid seed was Tk.4 per kg.

Encouraged by the results of hybrid maize production, IFDC, through FDI-II, took the initiative to introduce hybrid maize for commercial production in cooperation with the assistance of NGOs, GKF, and the private sector during 1992-1993. Hybrid maize was cultivated in 1,301 acres during 1992-1993 Rabi season compared to none in 1990-1991.

The average yield of maize was 6 MT per hectare. This program continued and a total of 1,831 acres were planted during the Rabi season of 1993-1994, an increase of about 41% over that in 1992-1993. IFDC provided training to the personnel of GKF, NGOs, and the private sector on maize production technology before the planting seasons in both years and continued to provide technical service for planting, harvesting, post-harvest operations, and marketing of maize grain.

Table 3.17 Yields from Maize Varietal Demonstrations under FDI-II, 1992-1994

Rabi-Boro 1992-1993

Variety	Subli, Bogra	Jamalpur, Bogra	Joynandahat, Dinajpur	Mongalpur, Dinajpur	Raniganj, Dinajpur	Laterhat, Dinajpur	Average yield
	Kg per hectare						
Hybrid							
PAC-11	11,248	6,262	7,351	6,953	6,956	11,849	8,437
Cargill	9,159	5,995	5,926	6,084	7,568	13,120	7,975
P-3276	8,678	6,757	5,638	6,788	7,165	10,795	7,637
P-3252	7,383	5,686	6,723	4,398	7,727	10,843	7,127
Local composite							
Barnali	7,586	4,269	5,809	4,814	5,935	9,591	6,334

Rabi-Boro 1993-1994

Variety	Sherpur, Bogra	Subli, Bogra	Birganj Dinajpur	Thakurgaon GKF (T.C.)	Average yield
	Kg per hectare				
Hybrid					
PAC-11	8,507	9,997	11,336	5,950	8,948
DK-888	9,065	10,014	7,515	6,783	8,344
PAC-156	8,192	7,153	8,774	7,866	7,996
Local composite					
Barnali	6,866	7,326	8,382	5,842	7,104
Shuvra	7,270	6,929	5,784	5,513	6,374

Source: FDI-II

The significant achievements of maize production under FDI-II encouraged other farmers to grow hybrid maize and the hybrid maize area increased from nil in 1987-1988 to an estimated 1,100 acres with an estimated production of 2,200 MT in 1992-1993. The increased production helped to create more job opportunities, especially in the poultry industry where maize is used as feed.

Production and Marketing of Baby Corn: Under FDI-II, baby corn was introduced for demonstration purposes in the Ghorasal area. The field results indicated a yield of 130,910 cobs per hectare. The cost of production was about Tk.12,000 per hectare and the net return was Tk.53,000 per hectare at a price of Tk.0.5 per cob. Baby corn was produced at Ghorasal so that the product could be sold to the PRAN canning factory also located at Ghorasal. The PRAN factory was not able to buy all of the baby corn from the growers and FDI-II came forward to explore marketing opportunities. After much effort, restaurants in Dhaka city also purchased baby corn. Simultaneously, the private sector fertilizer distributors and farmers took a keen interest in baby corn. Farmers at Bogra, Savar, Kashimpur, Uttara, Ghorasal, and other locations started growing baby corn which is sold in Dhaka.

DAP Use, Sales Promotion, and Demonstrations: Di-ammonium phosphate (DAP) is a compound fertilizer containing 18% nitrogen and 46% phosphate. DAP was first imported in Bangladesh in 1979 and over 300,000 MT were imported and sold by 1985-1986. Another consignment of about 33,000 MT was imported in 1992-1993 with USAID funds. Because of the long term absence of DAP in the market, the reintroduction of DAP was essentially a new product. Initially, farmers were reluctant to buy DAP and FDI-II through the private distributors undertook an intense promotional program to popularize this product among farmers. This promotional program included discussions in training programs, group discussions with DAE personnel, and television publicity. In addition, IFDC produced and distributed leaflets on DAP throughout Bangladesh (**Annex III**). Field demonstrations were also organized to demonstrate the performance of DAP compared to TSP.

Despite these efforts, the success in the market was minimal. This was largely due to price and specifically, the fact that DAP was priced at a 20% premium compared to TSP. In late 1993 USAID, in direct response to the needs of easing the financial burden on the two DAP importers and to speed the introduction of DAP, decided to reduce the DAP cost to the importers to the equivalent TSP price. As a result, sales increased in late 1993 (**Annex VII**).

Demonstration, field days, and publicity: Fertilizer and crop demonstrations, field days, and publicity are essential to facilitate technology transfer. Under FDI-II, a total of 998 demonstrations and 83 field days were organized through BADC, DAE, GKF, and the private sector. Detailed information on the number of demonstrations by crop and field days by year are shown in **Annexes VIII and IX**, respectively. The demonstration programs on balanced fertilizer use covered mainly Boro and transplanted Aman rice, wheat, mustard, potato, maize, baby corn, and vegetables. In addition to maize varietal trials, all demonstrations were conducted to demonstrate proper fertilizer use practices and efficiency.

During the field days, farmers were introduced to improved agricultural technologies by the speakers in languages and styles understandable to Bangladeshi farmers. Farmers are often convinced of the superiority of the technology through question and answer sessions and observations of the demonstrations. Farmers in the greater Rangpur and Dinajpur

districts leased out land in 1992-1993 to GKF for maize cultivation but did not participate directly in maize production. However, during 1993-1994, motivated by the demonstration and field days programs, farmers in these areas cultivated about 200 hectares of maize on a share cropped arrangement with GKF.

The Management Information System

The development of a private sector fertilizer marketing system requires accurate and timely market information to facilitate decision making by fertilizer traders. Such information is also critical to the MOA in support of its policy reform initiative and monitoring of market conditions. The Bangladesh Bank, participating banks, BCIC, members of the Bangladesh Fertilizer Association, USAID, and other donors rely on detailed market information for conducting fertilizer related programs. The market information maintained under the FDI-II management information system (MIS) includes data on the impact of policy changes, and data needed to accomplish the project purposes and to manage the project, and the fertilizer sector on a current basis.

The MIS of FDI-II (1) helps to ensure transparency in fertilizer marketing, and (2) provides policy makers with better and timely information as a basis for sound policy making. The design of the MIS was based on several key principles:

- Efficient use of data bases,
- Direct linkage between the data and the specific management questions raised by BADC, USAID, BCIC, MOA, BFA, the Bangladesh Bank, and others, and incorporation of data analysis and proposed action as important elements of standard reports,
- Supplementing standard reports with regular scheduled briefings and policy statements,
- Automation to improve timeliness and flexibility, and
- Phased institutionalization of the system.

The main activities of the monitoring system included collection of data on a broad range of topics including the institutional and economic aspects of fertilizer distribution, the determinants of fertilizer use, current knowledge and practices concerning fertilizer, and the profitability of fertilizer use under different circumstances. The MIS also includes data on fertilizer production, import, stock, sales, prices, use, output prices, and the cost and availability of credit.

Monitoring Reports

The output of the MIS served as a basis for series of reports that include the following:

- *Weekly Report on BCIC Fertilizer Production and Sales*: To keep the policy planners informed about fertilizer production and sales, this report was published regularly on a weekly basis (**Annex X**).

- *Fortnightly Report on Farm-level Fertilizer Prices*: This report provides information on farm-level prices of urea, TSP and MP in 61 districts as a requirement of MOA (**Annex X**) and was produced each fortnight.

- *Trade Bulletin*: With a view to bring more efficiency in fertilizer marketing, a trade bulletin (1,500 copies) is published on a fortnightly basis to provide information to distributors on the current fertilizer market including import schedules, international fertilizer prices, sales by factories, stocks of fertilizer, wholesale and farm-level prices of fertilizers, and projected demand (**Annex X**).

- *The Farm-level Fertilizer Price and Availability Survey*: A monthly survey of farmers was conducted to collect primary data on farm-level prices and availability of fertilizer. It also provides information on the use of other agricultural inputs such as organic manure, seed and seedlings, agricultural credit use by farmers, participation of fertilizer dealers in providing credit and technical advice to the farmers, and gender disaggregated data on agricultural labor. This survey was originally conducted in 20 regions interviewing about 900-1,000 farmers per month. Later, to meet MOA requirements, this survey was expanded to 61 of the 64 districts in Bangladesh, excluding 3 small districts of Chittagong Hill Tracts and the number of farmers interviewed ranged between 2,500 and 3,000 monthly at the end of FDI-II (**Annex X**).

- *Monitoring Report on Fertilizer Distribution*: This report was produced monthly and concerned the monitoring and evaluation of the production, imports, distribution, availability, consumption, and stock of various fertilizers in Bangladesh. It provided suggestions for achieving efficiencies in the process of privatization in fertilizer trading. Data on fertilizer procurement, sales, and stock are collected from BCIC factories, importers, and distributors in major sales centers (**Annex X**).

- *CCP Monitoring*: IFDC monitors the CCP on a monthly basis and collects data from the branch offices of the scheduled banks in which the distributors have credit accounts. This report shows the amount of credit requested from

CCP funds, credit used, credit refinanced by Bangladesh Bank, and loans past due. Any deviations are immediately noted and corrective measures suggested. This information is also used to adjust the replenishment schedule of CCP funds to Bangladesh Bank to take action on arrears and evaluate whether the credit terms permit effective use of the funds (**Annex X**).

- *Quarterly Progress Report*: The quarterly report highlights selected information of an operational nature pertaining to the activities of FDI-II. The report also shows FDI-II inputs, activities, and achievements with reference to the work plan and recommendations being implemented by decision makers. This report also shows aggregate changes and trends during the cropping season that terminated during the quarter prior (**Annex X**).

- *Annual Progress Report*: The annual report contains an analysis of the development of the fertilizer distribution sector and obviates much of the need for costly special evaluations (**Annex X**).

- *Farm-level Fertilizer Use Survey*: To examine the impact of the FDI-II project, a farm-level fertilizer use survey (FLFUS) was conducted across the nine cropping seasons starting from Rabi-Boro 1988-1989 and continued through Aman 1991-1992. The objectives of these surveys were to (1) assess the variability in the use of fertilizer by different crops and the prices of fertilizers and crops by region, (2) assess the impact of privatized fertilizer market at the farm-level in terms of performances of yield and revenue by crop and farm-size, and (3) assess the cost and returns by crop and farm-size and the effect on the income generation (**Annex X**).

- *Special Studies*: The FDI-II project MIS includes monitoring data that are collected on a regular basis and data from a number of special studies designed and conducted to answer specific ad-hoc questions. The studies were needed to (1) answer specific questions, such as the determination of an equal ex-factory price for all urea factories, the ramifications of closing the NGFF or CTSP complex, and the impact of subsidy withdrawal on fertilizer prices, (2) determine the implications of the FDI-II project and possible need for additional investments, (3) determine policy issues constraining fertilizer marketing by the private sector, and (4) studies that establish targets against which performance can be measured (**Annex X**).

As a summary, **Annex X** shows the objectives of each report, information provided, and the decisions facilitated by the reports. In addition, numerous briefing papers, ad-hoc reports, and synopses were prepared and submitted as requested by MOA, USAID, BCIC, Banks, government agencies, and donors. These reports were useful and instructive to guide policy discussions, develop strategies and generally served as a basis for policy reform and implementation.

Briefings

FDI-II developed a system for providing informal briefings for decision-makers, especially BADC, MOA and BCIC officials, bankers, and deputy commissioners that have proven quite effective. Most of the officials appear to have used meetings and conversations as their primary source of information rather than final reports, but the FDI-II MIS provided material for oral briefings. These briefing sessions normally focused on major accomplishments, current or potential difficulties, options for resolution, and opportunities for further progress in developing the private fertilizer sector. Such meetings were problem solving sessions, where FDI-II data were used to identify problems and suggest remedial actions.

MIS Automation

Until August, 1988, the FDI-II project performed all kinds of data and word-processing work manually. With the installation of computers in September, 1988, FDI-II began using a modern computer system that provided information processing facilities for all data collection and analysis work. As the project moved towards achieving its objectives, more and more information processing became necessary which eventually called for enhancing computing resources. To meet such growing demand of quick information storage and retrieval, computer programs, and procedures were written and faster file access systems were used by introducing local area network technology. Personnel were trained in using applications, procedures, and standardized programs and packages were adopted.

In general, steps were taken to computerize all surveys and analyses conducted by FDI-II, automate major activities, and develop expertise in information processing within the shortest possible time. Because monitoring and evaluation activities formed a large part of the project and several monthly and other timely reports had to be produced, high priority was given to this work. Evaluations of special studies were conducted for BADC in the areas of cost analysis of fertilizer distribution and transportation and the reorganization of the BADC's fertilizer wing. At one stage the "Farm-level Fertilizer Use Survey" data processing came under the direct supervision of the FDI-II where the existing computing facilities were used to expedite the seasonal survey analysis. Additionally, survey data processing requests from the marketing and credit units of FDI-II were also designed and implemented. Programs were developed and installed for accounts and personnel section activities under an office automation plan. **Annex XI** shows the databases stored by FDI-II.

The MIS activities of the FDI-II project, supported by computer systems, accelerated the flow of information which was in great demand at the Ministry of Agriculture, USAID, and other national and international agencies. The computer facilities were significantly improved to meet the growing information and communication needs FDI-II and the automation of office operations.

The monitoring activities of FDI-II served BDG and USAID who need timely data on the fertilizer program to make necessary modifications to improve effectiveness. Second, the information served the banks, importers, distributors, and dealers by allowing them to make more informed decisions about the fertilizer market. Third, the information helped document and evaluate the fertilizer sector reform program as a case study for policy makers in Bangladesh and several other countries that are considering privatization endeavors.

MIS Institutionalization

The scope of work of FDI-II visualized institutionalization of the MIS in the public and private sectors. With this in view, FDI-II put emphasis on the continuation of the MIS within MOA to strengthen the capacity of the Ministry of Agriculture. FDI-II organized short-term training for the officials of the sector monitoring unit of MOA. The training program focused on (1) systematic collection of data and analyzing data on the fertilizer sector, (2) disseminating information, and (3) analyzing data. The regular activities of MOA could not allow their officers to participate in the training program regularly. Moreover, MOA did not have a staff to conduct the field surveys to collect primary data on fertilizer prices and other fertilizer related activities. Ultimately, the plan to institutionalize MIS within MOA was deferred mainly because of these constraints, but shall be a major activity under the proposed Agribusiness and Technology Development Project. A plan for institutionalizing the MIS is shown in **Annex XII.**

In the case of private sector, the absence of a fertilizer association, made it difficult to accomplish the task of institutionalization of MIS. However, the BFA will take the lead in institutionalizing the MIS to obtain timely and systematic information on fertilizer prices, markets, credit and other factors. Steps are now being taken to transfer to BFA the responsibility of publishing the fertilizer trade bulletin.

The Development of Infrastructure

The objectives of infrastructural improvements during the FDI-II were to pursue the expeditious implementation of enhanced physical access on the part of private fertilizer distributors', to all domestic factories and ports in Bangladesh. FDI-II activities for infrastructural improvements are summarized below.

- Required infrastructural improvements were identified for better factory access, better loading facilities for barges and rail wagons, bulk delivery systems, improved handling at ports for imported fertilizer, and low cost storage by private distributors.

- With the introduction of direct factory sales of urea, majority of private wholesalers and dealers are procuring urea fertilizer from BCIC's factories and they rely on truck transport for distributing in greater Dhaka, Tangail, Mymensingh and Kishoreganj districts. These routes were quite hazardous in parts. After careful surveying and planning several improvements were recommended in these routes and subsequently implemented by the concerned authorities.

- Several aspects of infrastructural requirements of different factories were inspected, reviewed, evaluated, and improvements made in the delivery system.

- FDI-II technical assistance in rail monitoring services for fertilizer movement benefitted the fertilizer distributors.

- FDI-II has been directing its efforts towards construction of approach roads to the factories, road improvement, railway transportation, and river port transportation. These changes benefitted fertilizer distributors by better access to factories and ports, transportation in general.

The Project Facilities

The FDI-II facilities initially included only a project office in Dhaka. Following policy reform, requirements to monitor farm-level fertilizer prices, availability, import requirements, and domestic stock increased greatly. In order to cope with the increased monitoring work load of the project and BDG, FDI-II work was reorganized and expanded. Three regional project marketing offices at Chittagong, Khulna, and Bogra were established under the supervision of HCN specialists to co-ordinate, monitor, and guide private sector marketing operations including procurement from ports and factories, private sector importation, inventories of private distributors, buffer stock, demand forecasts, product demonstration, technology, training and monitoring, wholesale and retail prices of fertilizers, and dealer and retailer activities. The regional marketing offices provided excellent linkages with the ports, fertilizer factories, and all agricultural areas. The role of the regional offices, staffed with one HCN advisor and 10 other staff, facilitated development, and monitoring of the private sector fertilizer market.

The project office at Dhaka included a library, a conference room, and office space for about 120 staff. To provide transportation for project work, a total of 32 staff vehicles, one bus, and 45 motor cycles were used. A list of non-expendable items procured through FDI-II is shown in **Annex XIII**. Such project facilities played a key role in assuring opportunity and problem identification, smooth transfer of technology, and efficiency in data collection from 61 districts in the country.

The Technical Assistance

The successful implementation of FDI-II could not have been accomplished without a strong TA staff comprised of 10,841 person months of HCN staff, which includes 17 advisors, 148 skilled staff and 51 clerical and other staff, 254 person months of long term expatriate staff that includes 3 consultants and 75 person months of short term consultants. The HCN staff included specialists with a proper blend of business acumen, technical expertise, and professional qualifications. The long term expatriate consultants provided project direction and insight to policy and technical issues. However, the keys to the success of FDI-II were the common understanding by HCN and expatriate staff of the project goals and objectives, the ability to design and implement a strategy to accomplish the objectives, and a spirit of cooperation to achieve success. Both long-term and short-term consultants were used to respond to project needs and requests for technical assistance or special studies from BDG and USAID.

The policy reform component was executed under the supervision of an expatriate long-term consultant who served as the Chief of Party-cum-Marketing Consultant. In addition, he was required to work with all BDG ministries and agencies related to fertilizer, banks, and the private sector to continue expanding and improving the efficiency of the marketing system and redefining public and private sector roles. The COP directed the activities of the marketing unit that included host country national (HCN) specialists and support staff. The unit conducted studies, monitored private fertilizer business, and focused on constraints to private sector development and appropriate policy reforms.

The Credit Unit was under the supervision of a long-term expatriate credit consultant. He was engaged in assisting in the development of a credit program for fertilizer dealers. The credit consultant worked jointly with MOA, Bangladesh Bank and commercial banks and closely monitored the commercial credit program under FDI-II. The credit consultant was supported by HCN specialists and supporting staff in carrying out the project activities.

The Dealer Development, Training and Technology Transfer Unit was directed by the long term dealer development and training consultant supported by a number of HCN specialists and other staff. After July, 1993 the activities of this unit were managed by the HCN staff under the supervision of COP. The activities of this unit focussed on (1) training of fertilizer dealers, farmers, BDG officials, and bankers, and (2) technology transfer through organizing demonstration plots, field days and farmer rallies in the areas of proper fertilizer application and crop diversification (maize) programs.

The long-term expatriate monitoring, evaluation and computer consultant (MEC) was responsible for supervising the *PM&E unit*. Initially this unit was managed by the credit consultant, but later the MEC consultant took over the responsibility. A number of HCN specialists and support staff were employed to assist the MEC consultant. Under the supervision of the MEC consultant, the HCN specialist developed and drafted all

monitoring reports related to fertilizer prices and availability, fertilizer distribution, and farm-level fertilizer use survey.

Table 3.18 shows the use of resident consultants, local staff, and short-term consultants by number and person months. About 98% of the projected total person months was used during the LOP.

Table 3.18 Total Person-Months Used during the FDI-II Project

Type of Consultant	Total person-months	Percent used compared to planned effort
Long Term Expatriate Consultants		
Chief of Party-cum-Marketing Management Consultant	84	
Financial-Credit Consultant	74	
Dealer Development and Training Consultant	71	
Monitoring, Evaluation, and Computer Consultant	25	
Sub-Total	254	99
Short Term Consultants		
USA	37	
BDG	38	
Sub-Total	75	69
HCN Staff		
Consultants	1,117	
Skilled staff	7,579	
Clerical and other staff	2,145	
Sub-Total	10,841	98
Total	11,170	98

Source: FDI-II
Note : Figures are rounded and shown as of August, 1994.

In addition to long-term expatriate consultants and HCN staff, short-term consultants were also employed to conduct special studies to fulfill the needs of the project. The number of reports published by the FDI-II staff by year is shown in **Table 3.19**.

Table 3.19 Number and Types of Reports Produced through FDI-II

Report	Fiscal Year								
	1986-1987	1987-1988	1988-1989	1989-1990	1990-1991	1991-1992	1992-1993	1993-1994	Total
Regular Reports									
BADC Fertilizer Marketing Plan	1	1							2
Monthly PDP Minimum Lifting Pilot (MLP) Program Monitoring Reports		1	9						10
Monthly TDP Monitoring Reports		1	12	8					21
Monthly Monitoring Reports on Fertilizer distribution				4	12	12	12	12	52
Farm-level Fertilizer Price and Availability Survey Reports	2	12	12	12	12	12	12	12	86
Fertilizer Sales and Stock Report BCIC Factories							11	52	63
Fortnightly Report on Farm-level Prices							4	24	28
Trade Bulletins							5	24	29
Monthly Statement of Credit to Fertilizer Distributors				6	12	12	12	12	54
Periodic Reports									
Quarterly Progress Reports	1	4	4	4	4	4	4	4	29
Annual Reports		1	1	1	1	1	1		6
Farm-level Fertilizer Use Surveys				2	2	2	3	1	10
Crop Monitoring Reports					12				12
Special Study Reports	4	3	6	11	3	5	3	4	39
Total	8	23	44	48	58	48	67	145	441

Source: FDI-II

Support from IFDC Headquarters

The guidance and support from IFDC Headquarters in Muscle Shoals, Alabama, USA facilitated greatly the implementation of FDI-II. In addition to overall guidance and supervision of FDI-II, the contributions of IFDC Headquarters improved on (1) organizing, managing, and coordinating all external training and tour programs, (2) providing short term consultants for special studies and installation of a local area computer network, (3) assisting in the procurement and shipment of project commodities from the USA to Bangladesh, (4) providing support for administrative and accounting matters, and (5) library support services.

The Headquarters of IFDC played a key role in coordinating and organizing external training and study tour programs for FDI-II. The training programs were held often within IFDC Headquarters. The training programs were very beneficial to the participants and included topics such as fertilizer marketing management, agro-industrial project analysis, administration of commercial credit and international finance, fertilizer and irrigation

technology, and agribusiness entrepreneurship. The libraries of IFDC Headquarters and the Tennessee Valley Authority (TVA) were allowed to be used by the trainees to improve their knowledge in these areas.

Short term consultants were regularly assigned from IFDC Headquarters to supplement the staff in Dhaka. A number of reports published through FDI-II were completed by short term consultants from IFDC Headquarters. Their activities mainly concentrated on (1) developing a management information system, (2) suggesting fertilizer policy options for BDG, (3) installing a local area computer network, (4) evaluating domestic training programs, (5) preparing profiles of dealers and retailers, (6) improving data processing procedures, (7) evaluating the administration and financial systems of FDI-II, (8) formulating a variable pricing policy, and (9) conducting an environmental assessment of fertilizer factories in Bangladesh.

IFDC Headquarters also extended support to FDI-II through procurement and shipment of project commodities from the USA to Bangladesh. The enthusiasm and contributions of IFDC Headquarters throughout the LOP were essential for the success of FDI-II.

Project Administration and Accounts

Project implementation started immediately after the contract was signed between IFDC and BADC in March, 1987. Initially, project administration and accounts were managed by one HCN staff member under the direct supervision of COP. Later, administration was separated from accounts to improve the FDI-II internal control system. The administrative unit, headed by a HCN staff member and reporting through COP, developed and maintained the FDI-II systems and procedures for all business transactions, asset use, and record keeping in compliance with USAID guidelines. In addition to other work, the administrative unit was responsible for managing personnel including staff recruitment and maintenance of employee records.

The accounts unit, also headed by a HCN staff member under the direct supervision of the COP, maintained the accounting system in compliance with USAID guidelines and in accordance with generally accepted accounting principles. This unit maintained all accounting records including (1) documentation to support and verify all receipts and disbursements of funds, (2) maintenance of journals and ledgers, (3) reconciliation of bank statements, (4) inventory records of all project fixed assets, and (5) financial statements, budgets, and budget analyses as per USAID guidelines and FDI-II requirements.

The project cost was initially estimated at U.S.$ 6 million during the LOP. Subsequently, this amount was increased with the extension of project period and expanded scope of work (**Table 2.1** of Chapter II). **Table 3.20** indicates the amount spent as of June, 1994 by line item. It is expected that about U.S.$ 17.9 million will be spent as of August 29, 1994, which is about 97% of the estimated budget.

Table 3.20 Actual Expenditures during LOP of FDI-II

Costs	Total estimated budget March, 1987 through August, 1994	Total expenditures March, 1987 through June, 1994	Estimated total expenditures July and August, 1994	Estimated total expenditures March, 1987 through August, 1994	Projected balance	Percent of actual use
	U.S.$					%
Resident Consultants	3,178,400	3,068,600	85,400	3,154,000	24,400	99
Short Term Consultants	1,082,500	852,900	105,900	958,800	123,700	89
FDI-II Office	6,494,900	5,920,000	386,800	6,306,800	188,100	97
IFDC Headquarters	172,300	172,900	13,300	186,200	(13,900)	101
Special Projects	592,500	528,800		528,800	63,700	89
Training	1,840,400	1,762,900	11,400	1,774,300	66,100	96
Sub-Total	13,361,000	12,306,100	602,800	12,908,900	452,100	97
IFDC Management Fee	5,167,500	4,727,200	246,800	4,974,000	193,500	96
Total	18,528,500	17,033,300	849,600	17,882,900	645,600	97

Source: FDI-II
Note : Figures are rounded.

IFDC was responsible for procuring equipment and materials for implementation of FDI-II and developed a system to record all purchases of project commodities with models, quantity purchased, unit price, total price, and current status. All project property shall be returned to MOA upon completion of the FDI-II project as required by the contract.

IV. PROJECT IMPACTS AND BENEFITS

FDI-II made major and beneficial contributions to improved fertilizer use technologies, fertilizer distribution efficiency, expansion of credit by the private and nationalized banks, employment generation, and increased agricultural productivity. The benefits followed from policy changes, improved bank credit, technology demonstration and promotion, and from the development and promotion of a competitive private sector fertilizer market. The principal benefits are: (1) fertilizer was available to farmers in all locations of Bangladesh at reasonable prices, (2) the number of farmers using fertilizer increased, (3) improved fertilizer use efficiency resulted in increased yields and returns to farmers, (4) new employment opportunities were created, (5) fertilizer imports were handled more efficiently and at substantially lower costs than by BADC, and (6) the BDG was able to reallocate funds from fertilizer subsidies to other areas of the economy. The project improved the financial viability of fertilizer dealers and enabled many to be self-employed. FDI-II also helped improve the working relationships between fertilizer dealers, bankers, domestic factories, and farmers. Of significant importance, FDI-II helped Bangladesh to achieve the goal of self-sufficiency in rice.

Farmers

Fertilizer use increased considerably. One of the important concerns of FDI-II was to make fertilizer available nationwide, specifically to small farmers at reasonable prices. The farm-level fertilizer use survey conducted since 1989 indicted that virtually all farmers in Bangladesh are using fertilizer. Differences in the number of users from season to season appear because some farmers may not cultivate crops during a particular season, some farmers may not apply fertilizer in all plots, and some plots were previously treated with fertilizer. Therefore, the percentage of farmers using fertilizer for a particular year may not be 100%. However, an estimate of IFDC based on various studies shows that number of farmers using fertilizer increased from about 8 million in 1986-1987 to about 11 million in 1991-1992 (**Table 4.1**).

Fertilizer use is widespread among small and marginal farmers in Bangladesh. Very few farmers currently cultivate crops without the use of fertilizer. One study[5] stated that "a 20 years ago farmers did not know how to farm with fertilizer. Now they do not know how to farm without it". The findings of the farm-level fertilizer price survey that was conducted monthly since 1988 indicated that the overwhelming majority of the farmers purchasing fertilizer from the retail markets are small farmers. The farm-level fertilizer use survey (FLFUS) conducted during Boro 1990-1991 found that the small farmers tend to use

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[5] Lewis, David J. Technologies and Transaction: "A study of the Interaction Between New Technology and Agrarian Structure in Bangladesh", Center for Social Studies, Dhaka, May 1991.

more inputs such as fertilizer and HYV seeds than larger farmers. The study showed that the farm-size has an inverse relationship with the average use of fertilizer per hectare. A reason for this may be that agriculture is the only source of income of small farmers and they want a maximum yield from their small piece of land and they argue that if they use less fertilizer, yields will decrease. This supports the findings of other studies which show that the adoption of modern technology is greater among small farms compared to large farms.

Table 4.1 Number of Farm-households Using Fertilizer by Farm-size

	1985-1986				1991-1992			
Farm-size	Total Number of farms (million)	Percentage	Number of farmers using fertilizer (million)	Percentage	Total Number of farms (million)	Percentage	Number of farmers using fertilizer (million)	Percentage
Small	7.5	70	5.6	74	10.0	81	8.7	86
Medium	2.7	25	1.9	73	2.0	16	1.7	87
Large	0.5	5	0.4	76	0.4	3	0.3	83
Total	10.7	100	7.9	74	12.4	100	10.7	86

Source: BBS various publications, and FDI-I and FDI-II, Sample Surveys, 1985-1986 and 1991-1992

Notes : 1. National figures on the farm-households were taken from various issues of BBS publications, the proportion for the year 1985-1986 by size class has been taken from the Report on the Census of Agriculture and Livestock, 1983-1984, BBS, while the same for the year 1991-1992 by size class has been taken from the Report on the Household Expenditure Survey 1988-1989, BBS, P. 140. Number of farmers using fertilizer and the relative proportion for 1985-1986 and 1991-1992 were estimated using the findings of various IFDC publications.

2. Small farmers are those who operate land of 2.5 acres, medium farmers 7.5 acres and large farmers operate more than 7.5 acres.

3. Percentages are rounded.

Higher input use leads to higher yields. The 1990-1991 FLFUS found that yields from the fields of small to medium farmers were consistently higher than those of large farmers. Although the differences were not great in rice, they were exceptionally higher for potatoes, sugarcane, and vegetables. Potato yields were about 21% higher on small and medium sized farms and as much as 50% higher for vegetables (**Table 4.2**). As the small farmers have very small plots, as large as 2.5 acres, the intensity of cultivation is obviously high.

Increased yields resulted in increased farm income. The government made a major move towards the removal of subsidies by a partial removal in August, 1991, more than a year before full subsidy removal in December, 1992. However, competitiveness among fertilizer distributors and cost efficiencies achieved in the marketing network moderated increases in farm-level prices. **Figure 4.1** shows fertilizer cost, total cost, total returns, and net returns to HYV paddy. In the case of HYV paddy, the net return to farmers has remained virtually constant over the last eight years. The net return ranged between

Tk.7,135 and 8,473 per hectare between 1986-1987 and 1991-1992. With the increase in cost and virtually no change in the HYV paddy prices, the gross return did not decrease, mainly because of the increased yield. Paddy yields between 1986-1987 and 1993-1994 increased from 1.4 MT to 1.8 MT per hectare, an increase of about 30%. The increased paddy yield is partly due to the increased use of fertilizer. During 1992-1993 net returns decreased mainly due to a sharp decrease in paddy prices compared to 1991-1992. Between 1991-1992 and 1992-1993 total cost increased by about Tk.2,000 per hectare and gross returns decreased by about Tk.3,700 per hectare. Therefore, it is estimated that farmers earned a low but positive net income. However, with the increase in the price of HYV paddy, the net return increased considerably from Tk.2,904 to Tk.6,450 between 1992-1993 and 1993-1994.

Table 4.2 Crops Yields by Farm-size for the Rabi-Boro Season of 1990-1991

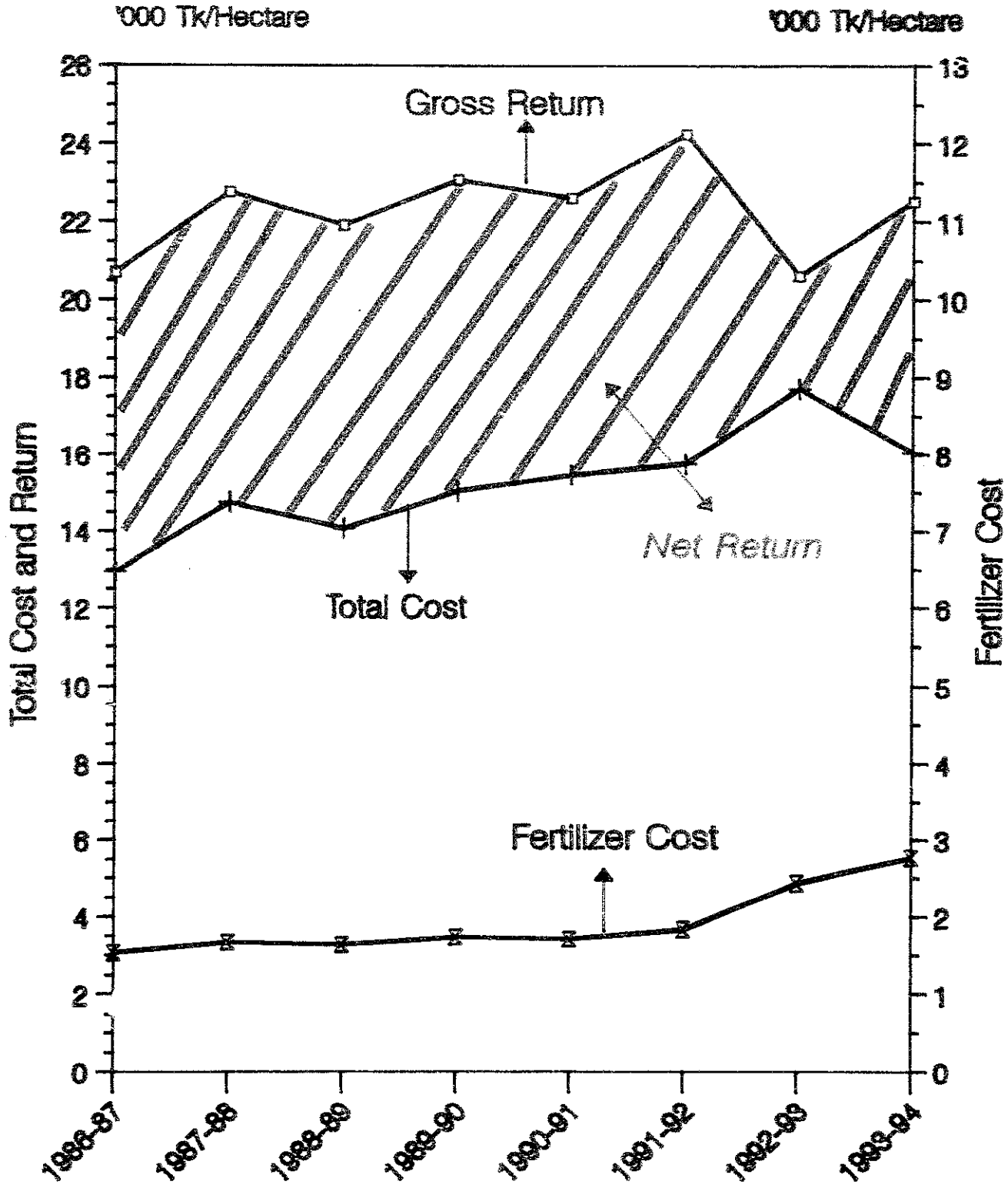
	Crop				
Farm-size	HYV Boro	LV Boro	HYV Potato	Egg Plant	Tomato
	MT per hectare				
Small	4.3	3.0	22.1	8.5	12.5
Medium	4.3	2.8	22.0	8.0	4.8
Large	4.1	3.2	18.2	3.0	4.8

Source: Farm-level Fertilizer Use Survey, 1990-1991 Rabi-Boro season, FDI-II

Dealers providing fertilizer on credit assisted farmers in purchasing fertilizer. The monthly survey on fertilizer prices and other agricultural inputs conducted by FDI-II found consistently that private dealers provide fertilizer on credit at nil to negligible interest rates which improved the ability of farmers to purchase fertilizer. The loans were mostly provided in kind. Between 1987 and 1994 the percentage of farmers who reported that access to funds limited their purchases to less then one bag declined from 23% to 1%. This demonstrates an efficient private sector service that benefits farmers.

Improvement of fertilizer distribution yields savings and benefits for Bangladeshi farmers. Monthly surveys of farmers show that prior to 1988 fertilizer products were purchased mainly in loose form. From 1988 to present, purchases in bagged form, which are less expensive, have steadily increased and resulted in real savings for Bangladeshi

Figure 4.1 Fertilizer Cost, Total Costs, and Net Return to HYV Paddy



farmers[6]. This is one of the outstanding benefits of the improvement in fertilizer distribution that resulted from agricultural privatization initiatives by the BDG. In 1987, about 35% of urea, about 35% of TSP, and no MP was purchased in bagged form. By the end of the first quarter of 1994, these percentages increased to about 90%, 75%, and 60%, respectively. **Table 4.3** shows that between 1988 and 1994 to date Bangladeshi farmers, who are undoubtedly the rural poor, saved about Tk.1,000 million or U.S.$ 25 million from increased purchases of fertilizer products in bagged form. The savings of farmers cited above made cash available at least for food, clothing, medicine, improved shelter, and other basic needs.

Table 4.3 Estimated Savings of Farmers due to Increased Purchases of Bagged Fertilizer from 1988 to 1994

	Fiscal Year						
Product	1988-1989	1989-1990	1990-1991	1991-1992	1992-1993	1993-1994	Total
	Million Taka						
Urea	41	157	128	162	143	167	798
TSP	-	35	43	45	54	13	190
MP		7	19	13	21	4	64
Total	41	199	190	220	218	184	1,052

Source: BADC Newsletters and Farm-level Survey, FDI-II

Notes : 1. 1986-1987 is the base year. 2. Bagged sales for 1986-1987 are estimated using the sales figures of the reporting year and the proportion of sample bagged sales during 1986-1987. 3. Bagged sales during 1988-1989 to 1993-1994 are estimated using the sales figures of the corresponding year and the proportion of sample bagged sales during these years. 4. Estimated savings are calculated by taking into account the difference between bagged sales of 1986-1987 and the corresponding years multiplied by the difference between loose and bagged farm-level prices during the same year.

Food Grain Production

Food grain production increased considerably. The project paper included a goal to increase agricultural production by 4% per annum. Although the project paper envisaged an increase in agricultural production, the benefit analysis here is confined mainly to food grain production because about 80% of agricultural land is devoted to rice and wheat and these two crops account for about 80% of the total fertilizer use.

[6] The cost per kg of fertilizer is lower from purchases of a full 50 kg bag as opposed to loose purchases of less than 50 kg. For example in Boro 1993-1994 the cost per kg of urea when purchased in 50 kg bags and in loose form were Tk.220 and Tk.250, respectively.

The project goal of a 4% annual increase in agricultural production was not achieved. This goal was set on certain assumptions. An important assumption for achieving the goal was that a favorable agricultural price policy would prevail and there would be adequate growth in other agricultural inputs, irrigation, improved seed, and pesticides. But the project paper did not specify as to what should be the growth rate in other agricultural inputs to attain a 4% increase in agricultural production. Therefore, fertilizer use is not the only factor for not achieving the project goal. Moreover, aggregate growth estimates of food grain production tend to distort the impact of fertilizer. Because a major portion (53-59%) of all fertilizers was used during the Rabi-Boro season.

With increased fertilizer sales, total food grain production increased from 16.5 million MT in 1986-1987 to about 19.5 million MT in 1992-1993 (**Figure 4.2**). Total food grain production increased by 18% during this period with an annual compound rate of about 3%. The seasonal trends in fertilizer consumption show that about 53-59% of all fertilizers was used during the Rabi-Boro season, 27-33% during the Aman season and 13-17% during the Aus season (**Table 4.4**). The total production of Boro rice, the season which accounts for more than 50% of all fertilizer use increased at an annual compound rate of about 9% during FDI-II. This dramatic increase in Boro rice production is attributable mainly to the increased HYV area, irrigation expansion, and intensive use of fertilizer. Total production of Aman rice increased at an annual rate of 3% during FDI-II.

However, production of Aus rice declined, which may be due to a decrease in acreage. The Aus area decreased from 2.9 million hectare in 1986-1987 to about 1.7 million hectare in 1992-1993. Wheat production increased at an annual growth rate of about 3% during this period, mostly due to an increase in acreage.

Incremental food grain production - food for additional people. An incremental food grain production of 3.0 million MTs between 1986-1987 and 1992-1993 provided food for an additional 15 million people.

Increased food production reduced the food gap. Increased food grain production reduced the national food gap by 69% between 1986-1987 and 1992-1993. The food gap declined from 1.3 million MT to about 0.4 million MT during that period (**Figure 4.3**). The food gap during 1987-1988 and 1988-1989 increased compared to the previous years because of crop losses due to the devastating floods of 1987 and 1988. The 1991 cyclone in Chittagong and floods in the northern districts reduced food grain production to some extent in 1990-1991 and another increase in the food gap occurred. Bangladesh is well on the way to achieving autarky in rice. The improved use of HYV seed, irrigation, and fertilizer encouraged farmers to increase cropping intensity. Cropping intensity which shows total cropped area divided by net cropped area as a percent in a particular year, increased from about 159% to about 172% between 1986-1987 and 1992-1993. This figure shows clearly that farmers in Bangladesh are practicing intensive cultivation and adopting improved technology.

Figure 4.2 Trends in Food Grain Production and Fertilizer Sales from 1986-87 to 1992-93

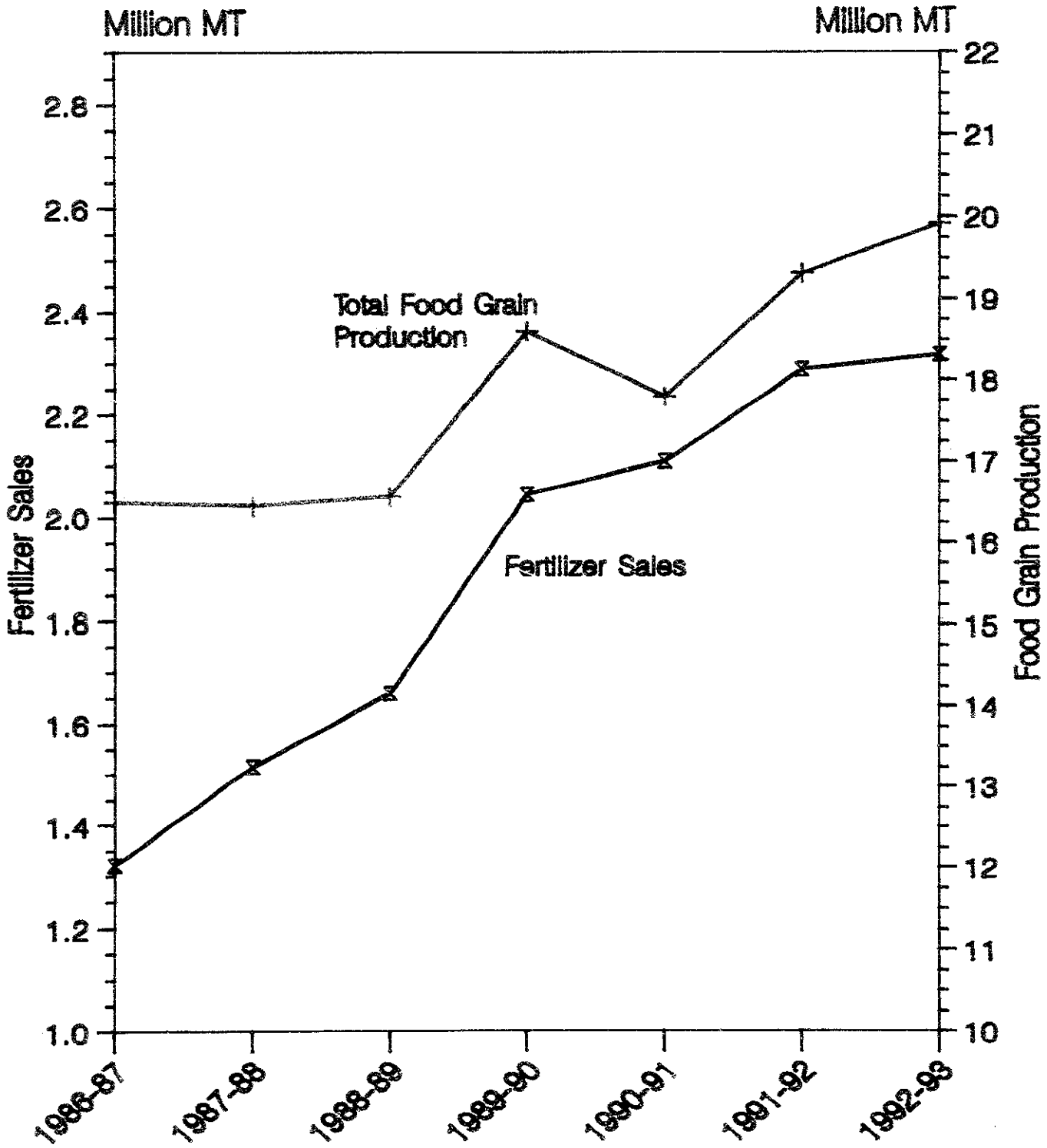


Figure 4.3 Food Grain Requirements and Net Production in Bangladesh 1986-93

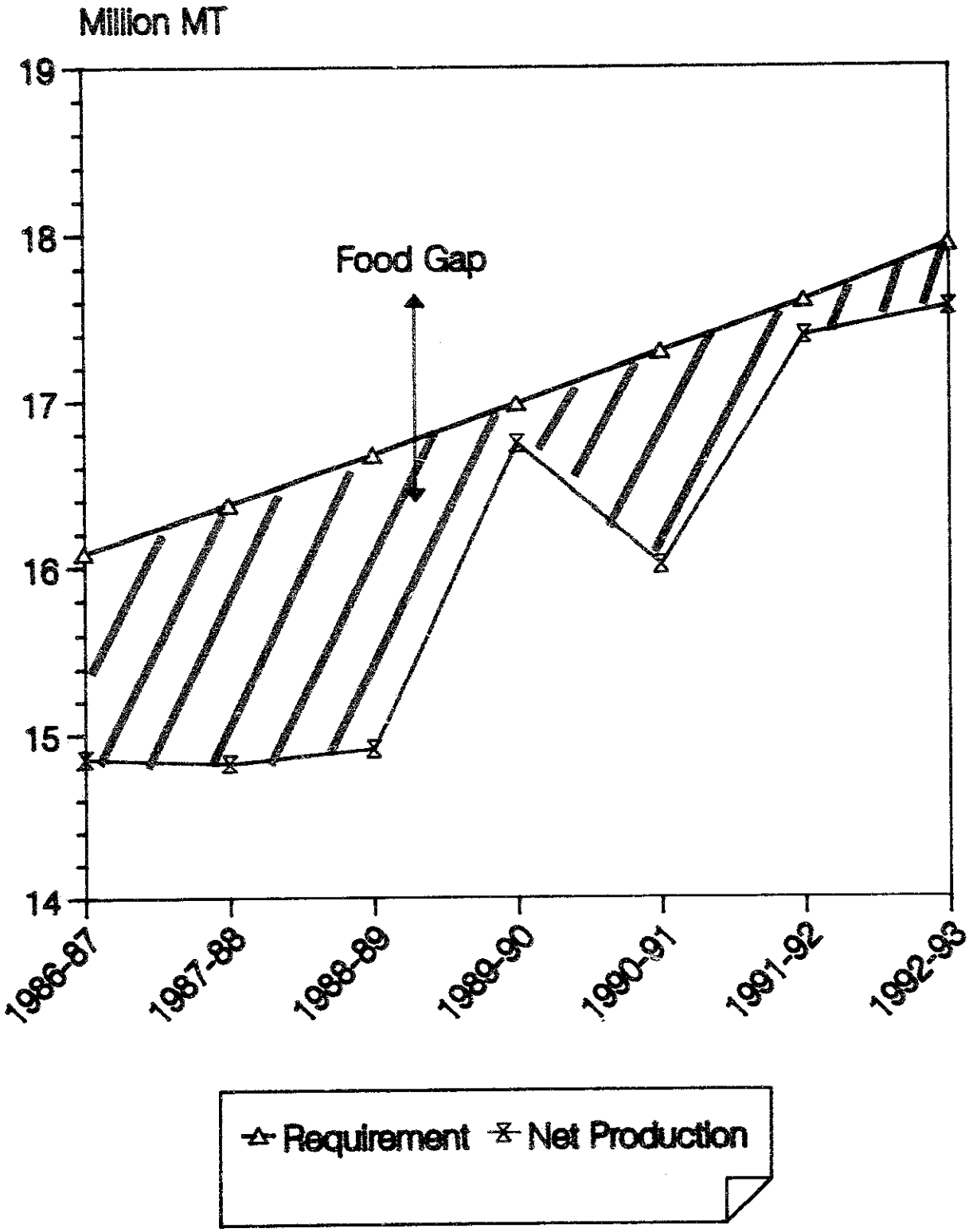


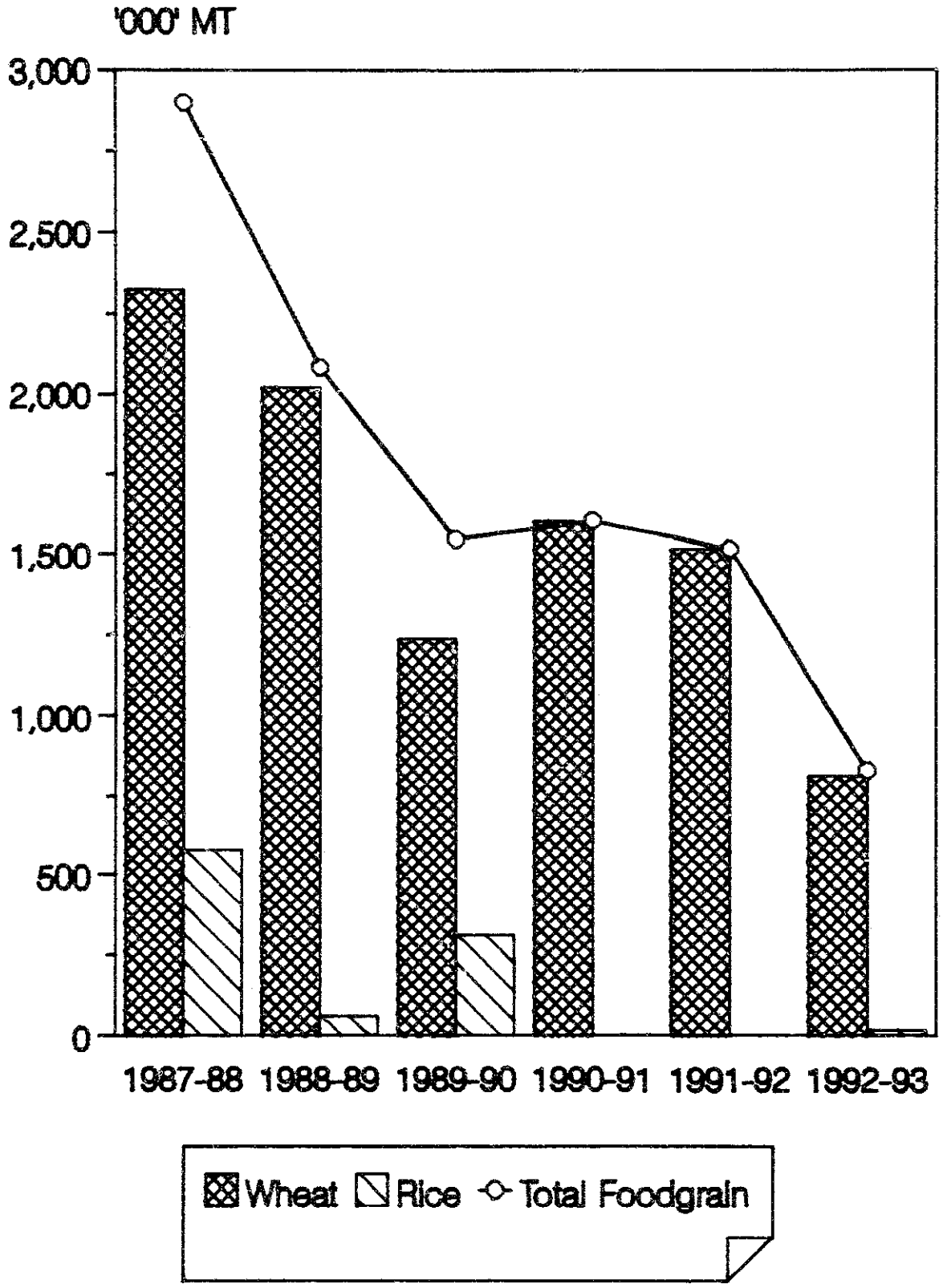
Table 4.4 Seasonal Trends in Fertilizer Sales

Fiscal year	Aman season (July-October)	Rabi-Boro season (November-March)	Aus season (April-June)	Total
	'000 MT			
1986-1987	385 (29)	718 (54)	218 (17)	1,321 (100)
1987-1988	408 (27)	896 (59)	211 (14)	1,515 (100)
1988-1989	475 (29)	950 (57)	234 (14)	1,659 (100)
1989-1990	580 (28)	1,166 (57)	298 (15)	2,044 (100)
1990-1991	668 (32)	1,142 (54)	298 (14)	2,108 (100)
1991-1992	722 (32)	1,214 (53)	351 (15)	2,287 (100)
1992-1993	743 (32)	1,277 (55)	296 (13)	2,316 (100)
1993-1994	735 (33)	1,197 (54)	286 (13)	2,218 (100)

Source: BADC Newsletters and FDI-II
Note : Figures in Parentheses are rounded percentages.

Increased food grain production reduced rice imports. Annual food grain requirements are met by importing rice and wheat. Food imports occur normally by cash, barter, credit, and grant funds. Sometimes imports were made under stiff credit terms in emergency situations. With increased food grain production, the import of rice and wheat declined considerably (**Figure 4.4**). No rice was imported during the last 3 years and this had a direct favorable benefit for the national budget and foreign exchange reserves.

Figure 4.4 Import of Food Grain in Bangladesh, 1987-93



Employment Generation

Prior to 1978, the fertilizer market was completely controlled by the public sector, that was selling fertilizer from 460 thana centers. At that time, there were approximately 60,000 appointed retailers but only 6,000 were active. After liberalization of policies in March, 1989, a large fertilizer distribution network was established in the private sector. According to recent FDI-II estimates, there are about 108,000 retailers who are active in the fertilizer trade, 13,000 wholesalers, 1,398 distributors, and 215 importers. These wholesalers, importers, and distributors employ about 60,000 persons. Thus, the total employment generated in fertilizer marketing, including the self-employed retail network, is estimated to be about 170,000 persons. If the average wage for these 170,000 persons is assumed to be U.S.$ 1 per day considering the minimum wage rate of Tk.40 per day for agricultural labor with a 200-day work year, this new employment generated U.S.$ 34 million per year in wages as a direct result of the privatization of the fertilizer sector.

An estimate from FLFUS data shows that farmers used an additional 55-66 person days of labor per hectare for fertilized HYV Boro plots compared to unfertilized plots. If this number is multiplied by the incremental acreage under HYV Boro between 1987 to 1993, (1011,000 X 55) an additional 60 million person days of farm employment were created in the fertilized HYV Boro area. The total incremental employment created could not be estimated but is surely substantial.

BDG Savings

BDG saved funds as a result of subsidy withdrawal and privatization of fertilizer importation and the domestic fertilizer business. Because fertilizer imports and domestic marketing are now in the private sector, the BDG no longer bears the expense of operating a state controlled system of fertilizer importation and marketing. Full cost pricing of fertilizer and private fertilizer business activity had a favorable impact on the national budget. BDG savings are calculated from 1988-1989, when direct sales to the private dealers from fertilizer factories began. Such savings[7] from 1988-1989 to 1993-1994 are estimated at Tk.4,758 million (U.S.$ 119 million) (**Table 4.5**). Of this amount, about Tk.1,759 million (U.S.$ 44 million) was due to subsidy withdrawal and the remainder of Tk.2,999 million (U.S.$ 75 million) was due to privatization of fertilizer procurement and distribution. Allocation of these savings to other development work, especially in the agriculture sector, would create beneficial multiplier effects.

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[7] Savings are defined here as the amount that would have been spent by GOB had the public sector been involved in the procurement and distribution of fertilizer at subsidized prices.

Table 4.5 BDG Savings Attributable to Subsidy Withdrawal and Private Fertilizer Business Activity

Fiscal year	Savings due to subsidy withdrawal	Savings due to private fertilizer business activity	Total
	Million Taka		
1988-1989		23	23
1989-1990		286	286
1990-1991		454	454
1991-1992	405	516	921
1992-1993	530	1,186	1,716
1993-1994	824	534	1,358
Total	1,759 (U.S.$ 44 million)	2,999 (U.S.$ 75 million)	4,758 (U.S.$ 119 million)

Source: BCIC monthly sales report and FDI-II

Notes: 1. Savings are calculated taking into account the costs (excluding fixed cost) of BADC in 1988-1989 for transporting fertilizer from ports and factories to PDPs and the withdrawal of subsidy from August, 1991 to December, 1992.

2. Subsidy is calculated considering the C&F price, factory price, and incidental costs of the corresponding period.

Fertilizer Importers, Distributors, Dealers, and Retailers

FDI-II resulted in the emergence of business entrepreneurs that are now actively involved as private sector fertilizer importers, distributors, and dealers. The market liberalization policies resulted in increased trade volume and ensured a fair return on fertilizer investments. The training provided through FDI-II benefitted the private dealers by strengthening their skills and facilitating the exchange of ideas in identifying constraints related to the fertilizer business, technology, imports, and use of capital. FDI-II provided support to establish the Bangladesh Fertilizer Association (BFA), which strengthened further the skills of fertilizer importers, distributors, and dealers. Overall, the FDI-II project benefitted fertilizer dealers in the following areas: (1) improved business acumen, (2) improved access to credit, and (3) improved ability to provide customer services to farmers to facilitate technology transfer.

Banking Sector

The lending institutions benefitted from the training programs of the project and improved their capacity to appraise loan proposals, reduce transaction costs, and improve recovery rates increased. As mentioned elsewhere in this report, the delinquency rate of

fertilizer sector loans is comparatively low compared to other sectors, such as the food grain trade[8]. As a result of the CCP of FDI-II, the commercial banking system has extended the scope of its activities to include providing loans to fertilizer importers, distributors and dealers. During the project life, the total amount of loans made for financing fertilizer inventories totalled about Tk.15,570 million (U.S.$ 389 million).

Women

FDI-II data show that there are no women fertilizer distributors or dealers in Bangladesh, but some men dealers are operating a fertilizer business in the name of their wife or daughter. Moreover, occasionally women do manage a fertilizer business when men are absent for temporary periods. The farm-level fertilizer price and availability survey also indicates that no women farmers purchased fertilizer from retail shops. Although there were no direct consequences for women through FDI-II, increased fertilizer use, which resulted in increased food grain production, provided work for women in post harvest activities. This certainly increased their income and improved their livelihood. Increased production resulted in increased farm-income. The policy reforms of FDI-II created employment opportunities for rural population and increased family income and these factors have a positive impact on women.

The FDI-II data base shows that women in Bangladesh contribute significantly to drying, winnowing, parboiling, composting, homegardening, and poultry rearing. Indeed, their contribution to these activities exceed those of men. The data base developed through FDI-II may be used to determine the roles of women in these activities by district of residence. Such data may also be used to guide the introduction of appropriate technology for use by women. FDI-II emphasized recruiting women staff as specialists and support staff. This provided an opportunity for those women to develop their careers, increase their skills, and improve their incomes. At the end of FDI-II, 20 women were employed by the project and represented 10% of the total staff. The FDI-II external training activities also included 2 women.

Indirect Benefits

A project like FDI-II which aims at creating a competitive atmosphere in the fertilizer marketing has significant secondary benefits which cannot be quantified. These benefits arise from linkages and the multiplier effect caused by the promotion of a stronger economy in rural areas. The value added in transport, storage, trade, and industry which flows in part due to increased fertilizer production and increased food production could not be quantified, but is substantial.

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[8] The delinquency rate of the loans to food grain traders was 80% compared to 24% to fertilizer traders as of March, 1994. Preliminary Foodgrain Credit Assessment, FDI-II, April, 1994.

The project indirectly provides economic benefits to the consumers of agricultural products. This is because increased fertilizer use increased yields and therefore, reduced production costs per unit of output, thus lower food prices benefitted poorer consumers[9]. Indirect benefits also accrued to the citizens of Bangladesh who are taxpayers, because their tax burden decreased as government expenditure decreased considerably when private sector importers, dealers, distributors assumed the role of public sector corporation, the BADC.

BADC

Many studies substantiate that modern technologies, such as HYV seed, irrigation, and fertilizer contribute to alleviating poverty in agricultural sector, and economic development in general. The FDI-II project by improving the use of fertilizer contributed to alleviating poverty in the rural areas of Bangladesh.

However, the consequences of FDI-II on the gradual demise of BADC cannot be disregarded. In a country like Bangladesh where unemployment is high, uncertainty about employment at BADC for a large number of workers created frustration among the employees. About 6,000 employees in fertilizer wing of BADC were displaced by the private sector. Although many found employment elsewhere, the fate of about 14,000 BADC employees remains uncertain and BDG still has an unnecessary fertilizer related budgetary burden. It incurs a cost of about Tk.200 million (U.S.$ 5 million) annually for overhead, salaries, and allowances of employees in the idle fertilizer wing.

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[9] Steven Haggblade, Evolving Food Markets and Food Policy, IFPRI, October 4, 1993.

V. LESSONS LEARNED AND SUSTAINABILITY

Lessons Learned

The FDI-II project is recognized as a model of the transition from a government controlled and operated fertilizer marketing system to a market oriented fertilizer sector. There are many factors which contributed to the success achieved through FDI-II including a sound project design, a capable and dedicated project staff, and adequate availability of resources needed for project implementation. However, an overlooked factor, and one which was absolutely essential to FDI-II project success was the productive working relationship that existed between USAID, the MOA and the FDI-II staff. This unique relationship driven by a common goal to achieve increased efficiency in fertilizer marketing, and improved fertilizer use was the key to project success. The experience with FDI-II offers instructive lessons and suggestions that provide a better defined strategy for the development of agribusiness in Bangladesh. The important lessons learned are discussed below.

BDG can affect the economic direction of agriculture sector through the enactment of policy changes. Well designed proposals, convincing arguments, and consistency in approach through technical assistance can persuade government officials and policy makers to undertake reforms. However, the crucial element in the successful implementation lies in strong political will, broad consensus, and firm commitment on the part of policy makers and implementors in government agencies. A firm stance on policy reform on the part of donors also plays a key role in persuading the policy makers. But tentativeness on the part of the government and frequent transfer of policy makers slows the process and policy reforms that have been implemented can be superseded or canceled.

Competitive market forces play a major role in stimulating agricultural sector efficiencies. The policy reforms in the fertilizer sector created a competitive market that resulted in increased availability of fertilizer throughout the country at reduced prices. Improved availability of fertilizer at competitive prices stimulated fertilizer use and thus agricultural production. The experience with FDI-II has shown that the private sector in Bangladesh can fulfil the important role of ensuring an adequate supply of critical inputs to farmers.

Donors and consultants working in concert with the Government is essential for project success. The establishment of a productive relationship between USAID, IFDC and MOA was essential to the success of the project. This relationship was based on trust and confidence in the capabilities and commitment of each. The success of FDI-II is linked closely with MOA's willingness to risk, policy reform to open the market to the private sector which ultimately led to the demise of the BADC monopoly. The MOA has implemented consistently key policy changes on the recommendations of IFDC to spur the transition to a market-oriented economy. Direct procurement from factories, private sector

imports, closure of BADC facilities, creation of private sector associations, and subsidy removal are examples of some of the major decisions made by the MOA to free the fertilizer market. IFDC communicates with MOA officials on a daily basis on substantial matters related to fertilizer market reform. Without doubt, the open communications and frequent meetings between IFDC, MOA and USAID laid the foundation for development of private sector participation in fertilizer marketing.

The excellent relationship between USAID, IFDC, and the MOA also extended to other institutions in Bangladesh such as the Bangladesh Bank, Ministry of Finance, BCIC, commercial banks, and the donor community. This relationship evolved over many years of close interaction and a solid spirit of cooperation to develop a fertilizer market driven by demand. IFDC also worked as an advisor to major donors in Bangladesh including, but not limited to the World Bank, ADB, DGIS, CIDA, and DANIDA.

A community of entrepreneurs must be fostered through technical assistance, training, and credit. This is essential in a truly free and competitive market. For example, in 1981 two types of businessmen operated in Bangladesh: small dealers and owners of large patronage houses who controlled virtually all trade and industry through an informal network of agreements. Privatization of the fertilizer sector before the development of a strong fertilizer business community would have created cartels in the fertilizer market.

The benefits of proposed policy reforms must be explained continuously to the public and private sectors. The government must be convinced of the benefits of decentralizing functions, and divesting itself of some authority. Field officials should be made partners in the process of change. Private business people must learn how to operate in a new policy climate. This is done through formal and informal meetings and exchange of objective information, through careful listening to expressed and unexpressed needs and fears, through continual support and encouragement. Therefore, policy projects call for substantial management and communication assistance and policy advisors must be chosen for their social skills as well as analytical capabilities.

Commercial credit is essential for agribusiness to replace production, distribution and marketing functions of the public sector, particularly in new, high risk areas. A program to encourage market-oriented bank lending at unsubsidized commercial rates can be of great assistance to new agribusiness that is struggling to become established. It can give new entrepreneurs the capital they need to purchase stock, upgrade facilities, or provide credit to customers.

Consideration should be given to Government employees displaced by the transition to a market economy. A major task of FDI-II was to ensure implementation of a reorganization plan for the fertilizer wing of BADC. Such efforts met with resistance from the labor union of BADC and reluctance on the part of some bureaucrats.

The timely and systematic flow of information is a key to the success of FDI-II project. The monitoring activities conducted through FDI-II kept private dealers, farmers and government policy makers continually informed of changing market conditions. Information on key indicators such as fertilizer stock, production, imports, international prices, domestic wholesale and retail prices, availability, credit availability and constraints and expected demand for fertilizer are valuable to all participants. The monitoring and evaluation strengthened the linkage between data collected and the specific management questions raised by MOA, BADC, USAID, BCIC, the Bangladesh Bank and others. The accurate and timely information on markets in a free competitive system helped policy makers make sound decisions.

Technology transfer is essential for privatization. A proper mix of technology transfer through direct technical assistance, training, and demonstrations is critical to the transition to a market economy and promote increased fertilizer use and improve agricultural productivity. Importers must be educated about import formalities, business skills of dealers must be developed if they are to succeed in a competitive environment, bankers require training to encourage their involvement in extending credit to a new sector. Fertilizer use practices must be properly demonstrated and the results adequately shown to farmers to encourage adoption of improved practices. Finally, it is essential to provide government officials insight into the actual operations of the fertilizer business, banks, and the role and activities of the government in a market economy.

Mid-Term Evaluation of FDI-II confirms the lessons learned:

- AID agricultural development projects with major policy reform objectives should be implemented over 5-10 years if institutional change is to be successful.
- Agricultural policy reform must be viewed as an evolutionary process.
- Significant agricultural policy reform is possible, given sufficient resources and commitment by USAID and the host government.

One additional lesson learned from FDI-II is that deregulation policy permits the financial difficulties associated with privatization (e.g. finding a private enterprise willing to take over the excess staff and unused facilities of a state corporation) to be bypassed. Deregulation, however, does not alone solve social problems arising from unemployment or the inactivity of redundant personnel.

Shortcomings

No final report is complete without reference to the goals that were not realized or those for which only partial progress was realized. There are at least three areas that warrant discussion in this regard.

The assets of BADC, specifically, the warehouses were not transferred to the private sector or other government agencies as intended. When FDI-II commenced, BADC maintained about 346 warehouses with a total capacity of about 469,600 MT that was to be leased, sold or transferred but BADC did not comply. Only a capacity of 95,700 MT was divested and at the close of FDI-II, BADC retained a total warehouse capacity of about 373,900 MT. The warehouses are virtually empty but the BDG continues to incur costs.

Another shortcoming also involves BADC who had about 6,000 redundant employees at the close of FDI-II and represented a truly displaced public sector entity. Perhaps with other policies and actions a new role for BADC could have been created. Such a role may have included work in the private fertilizer sector that involved regulation, quality control, enforcement of legal weights and measures, environmental monitoring, monitoring fertilizer prices and availability and related work. But a displaced public sector entity with understandable vested interests does not capitulate or radically transform its work easily. Thus, BADC was not reorganized as some imagined possible and desirable.

There is one more shortcoming that is related to the sequence of policy reforms. As FDI-II closed, it became apparent that it would have been useful to the privatization effort to have formulated and implemented a policy on fertilizer regulations at an earlier date. This is also the case with the Bangladesh Fertilizer Association. If the regulations and the association were formed and implemented earlier in the project, some criticism of an unregulated market may have been avoided. An active fertilizer association could have acted as an interest group and source of information to counter unfounded accusations about the fertilizer market in Bangladesh.

Issues

Increased fertilizer use benefitted the country at large. A number of important policy reforms taken to promote the development of private fertilizer sector. Despite progress, the BDG was not always able to implement ideal policy reform and was subject to criticism by vested interests. The fertilizer sector is now faces the following development issues which need attention for sustainable and long term development.

Maximum Retail Price (MRP) of Fertilizers: The prices of fertilizers are a major issue of policy concern. Currently, all fertilizer imports are purchased at prevailing international market prices. Fertilizer prices among distributors, wholesalers, dealers, and retailers are determined by the market. Temporary price hikes caused mainly by the

seasonality of demand and short-lived supply demand imbalances, capture the attention of the political leaders and policy makers through media reports. Based on the frequent media reports concerning high prices, there is some interest in BDG intervention in fertilizer pricing. BDG would determine, implement, and enforce MRP of fertilizers. This concept is not consistent with the BDG policy reform to establish a market economy and a difficult task from an administrative and implementation point of view. The suggested action should be to adopt a variable pricing policy that was recommended to BDG by FDI-II.

Fertilizer Buffer Stocks: Interest has been shown by BDG in maintaining an intervention stock of fertilizers to "protect" farmers in remote areas from high prices and assure access to fertilizers. Such action would (1) cause additional budgetary problems for BDG, (2) displace private distribution in remote areas because of subsidized BCIC stocks, (3) create major disruptions in the market because the stock would have to be sold every 5 months to ensure product quality, and (4) dampen fertilizer stock and depress prices.

Use of Donor Funds for Importing Fertilizer: The private sector importers are now operating on a commercial basis. The importers choose supply sources with competitive prices that allow a profit to be earned. Fertilizer imports through donor funds do not allow the importer to procure from the least expensive source and the procedure is also cumbersome. As a result, during 1993-1994 the entire quantity of fertilizer was financed and imported through cash foreign exchange. The lack of interest among importers to use donor funds may be a concern to the government of Bangladesh.

The Fertilizer Control Order: Absence of a fertilizer control order is creating problems with respect to the quality, nutrient content, and correct bag weights of fertilizers. Enactment of a fertilizer control order is essential to (1) promote integrity and discipline in market place, (2) provide assurance that fertilizers are identified popularly, (3) provide assurances of the validity of the quality and quantity represented by sellers, and (4) protect the interests of farmers and traders. This order will be based on a truth-in-labelling concept.

The Bangladesh Fertilizer Association: The BFA is a new institution and needs continuous technical assistance to mature, develop, and prosper.

Market Intelligence: Market intelligence is a key factor in understanding the dynamics of a market economy. Information on all aspects of fertilizer needs to be disseminated to all concerns such as private sector importers, distributors, dealers, retailers, farmers, and policy makers. Data and information on fertilizer prices in the domestic and international markets, availability, and stocks are essential for management and regulation of the fertilizer sector. Therefore, the MIS of FDI-II needs to be institutionalized within the public and the private sectors. Otherwise, with the close of FDI-II, a void will be created in providing fertilizer market information that may lead to chaos and confusion in this sector.

A Final Note

The policy reforms in the fertilizer sector resulted in the establishment of a dynamic private sector fertilizer marketing network which has contributed to increased agricultural production through improved fertilizer availability at competitive prices for farmers. This has helped Bangladesh to virtually reach food grain self-sufficiency. Policies and programs already in place have brought rapid growth in agriculture. In the fertilizer sector, certain issues are yet to be resolved. For example, donor financing of imports, BCIC pricing and marketing policies, establishment of a national fertilizer regulatory system, and establishment of MIS in the public and private sector are all key issues which need to be resolved. The work of FDI-II are now ending. The void which may be created by the closure of FDI-II, will be filled under the proposed project of USAID, the Agribusiness and Technology Development Project (ATDP).

The ATD Project can start on a sound footing that has been developed by FDI-II. A vibrant economy for agricultural inputs offers the best prospect for sustained and broad-based growth in the agriculture sector. Current policies provide for further increases in the irrigated area and fertilizer use according to trends which have developed over the last several years. However, even faster growth in incomes and employment may be possible as the country turns toward higher value crops and creates an environment for a variety of agricultural production and service activities. The sustainability entails transformation of subsistence farming into commercial farming.

USAID will continue to support the efforts of BDG in changing agriculture from food grain production to other high value crops which is expected to accelerate growth in agricultural incomes, increase returns and demand for labor, and attract investment in agri-processing. The forthcoming Agribusiness Technology Development Project shall attempt to remove the barriers to increasing agricultural production, crop diversification, and economic growth in general. An expanded private agribusiness sector can make a critical contribution to achieving these goals.

The FDI-II project represents a success in market reform and privatization in Bangladesh that attracted attention from countries in Africa and Eastern Europe. Delegations from Egypt, Nigeria, Kenya, and Albania visited Bangladesh to gain insight into how similar work could be conducted in their countries. The staff of FDI-II shared views about the process of market reform, achievements, and shortcomings. The government of Bangladesh, through FDI-II, demonstrated to donors and the international business community that the country realizes the benefits of a competitive market and is willing to make difficult policy decisions and implement reforms that contribute to the economic and social well-being of its citizens.

Annex I Project Design Summary and Logical Framework

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS	ACTUAL ACHIEVEMENTS OF GOAL, PURPOSE AND OUTPUT LEVEL OBJECTIVES
GOAL Increased agricultural production	MEASURES OF GOAL ACHIEVEMENT - Minimum 4% average annual increase in agricultural production	- Official production data. - Sample surveys.	FOR ACHIEVING the GOAL - Distribution of weather conditions about normal. - Growth in complementary inputs adequate. - Agricultural price policy environment is favorable. - No abnormally high insect or plant disease infestation.	Foodgrain production increased by an average annual growth rate of 3% during the LOP. Therefore, 75% of the goal was achieved. The reasons for not achieving 100% goal level objective is explained in the text.
PURPOSE Increased use of fertilizer	END OF PROJECT STATUS - An average annual growth in aggregate fertilizer consumption of at least 8% over life of project	- Sample surveys. - Official production and import data.	FOR ACHIEVING the PURPOSE - GOB and fertilizer donors permit private distributors to operate under assistance agreement. - Farmers' cultural practices can be improved.	An average annual growth of 8% in aggregate fertilizer consumption was achieved during the LOP. Therefore, 100% of the purpose level objective was achieved. However, If the initial 5 year project period is considered, then aggregate fertilizer consumption increased by an annual rate of about 12%.
OUTPUTS 1. Assured fertilizer supplies. 2. Distributor and Dealer Credit Program. 3. Competing large scale and middle size fertilizer wholesalers. 4. Increased efficiency in fertilizer distribution and marketing. 5. Active fertilizer dealer development and sales promotion programs. 6. Improved access to fertilizer sales outlets.	MAGNITUDE OF OUTPUTS 1. Five month inventory of phosphates and potash and three month inventory of urea. 2. Distributors and dealers purchasing fertilizer with FDI-II credit. 3. A significant number of fertilizer wholesalers purchasing from depots, factories, and ports. 4. Decreases in per unit volume fertilizer distribution costs. 5. Dealer Development and Training Program of BADC assessed and found effective. 6. Physical accessibility improved at fertilizer sales outlets.	- Independent AID field surveys. - Bangladesh Government statistics.	FOR ACHIEVING OUTPUTS - Fertilizer supplies meet fertilizer demand. - Private fertilizer distributors and dealers shall compete not collude.	1. Fertilizer availability was adequate at the farm-level except spot shortages of urea and imported MP in some places due to BCIC's marketing policy and late arrival of ships, respectively. The fertilizer sales increased by about 70% between 1986-1987 and 1993-1994. 2. Distributors and dealers purchasing fertilizer with FDI-II credit and also credit being provided by the banks. 3. Fertilizer marketing is now entirely managed by the private sector. BADC is operating fertilizer marketing only in a politically disturbed district the Chittagong Hill Tracts in a very limited scale. 4. Fertilizer distribution costs decreased during post privatization period compared to pre-privatization period. Detail discussion is provided in Chapter 3. 5. The dealer development and training program proved worthwhile in managing the fertilizer business by the private sector. 6. Physical accessibility in all BCIC factories improved during the post privatization period compared to pre-privatization period.

Annex I Project Design Summary and Logical Framework

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
INPUTS	**IMPLEMENTATION TARGET**		**FOR ACHIEVING INPUTS**
USAID	**USAID**		
- Training and technical assistance.	- Training and technical assistance, U.S.$ 6 million.	- AID procurement and disbursement records.	- AID funding available
- Credit and Fertilizer.	- Commodities, mostly fertilizer or credit, U.S.$ 52 million.	- GOB budget materials.	- Undertaking of Government to provide required budgetary support.
- Physical infrastructure.	- Physical infrastructure, U.S.$ 7 million	- Independent AID field surveys.	- Other donor contributions materialize.
BDG	**BDG**		
- Insurance and execution of required policies, regulations and directives.	- Personnel and support services, U.S.$ 125,000.		
- Personnel and supporting services.	- Fertilizer and its logistical support, U.S.$ 600 million.		
- Fertilizer, transportation and storage.			
- Other budgetary support.			
Other Donors	**Other Donors**		
- Technical assistance.	- U.S.$ 450 million		
- Commodities.			

Source: FDI-II

Annex II Scope of Work for the FDI-II Contractor

1. Promote a more responsive and cost-effective distribution of fertilizer with interventions that focus on: open market competition, market information and research, farmer eduction, import deregulation, subsidy elimination, reorganization and downsizing of BADC, commercial bank credit procedures, and improved efficiencies in urea production and use.

2. Provide advisory services to MOA, BADC, BCIC, Bangladesh Bank, commercial banks, other agencies which may be identified from time to time, private sector and USAID related to the fertilizer sector, FDI-II implementation, and policies and actions affecting its implementation.

3. Develop and institutionalize within MOA and business groups all possible and appropriate market research and service functions, new product research and development, and data collection and analysis efforts. The computer-based management information system (MIS), developed for this purpose, will be streamlined for monitoring of key data and institutionalized.

4. Assist in developing appropriate product quality control methodologies, equipment, regulations and enforcement, provide training in the necessary quality control skills.

5. Increase the capacity of both the private and public sectors to plan, manage and evaluate fertilizer needs and priorities.

6. Improve and strengthen private sector and BDG capacities to produce and disseminate information concerning new technologies in a form and manner that responds to the needs of the client groups including farmers, fertilizer wholesalers, retailers, policy makers, planners and donors.

7. Strengthen overall private sector effectiveness in fertilizer marketing, human resource development, financial management, stock accountability, and business management.

8. Arrange both in-country and external training for personnel of MOA, MOF, MOC, BADC, BCIC, commercial banks, Bangladesh Bank, and the private sector. Strengthen and institutionalize training capabilities within BDG and the private sector for on-the-job skill development in fertilizer and agribusiness marketing to increase fertilizer and agricultural input consumption and utilization.

9. Improve banker capabilities in areas of credit administration and recovery procedures. Linkages between the private sector, MOA, BCIC, Bangladesh Bank and the commercial banking sector will be continued and expanded.

10. Engage and supervise sub-contractors, as required, for special studies during the contract implementation, in consultation with the Ministry of Agriculture and USAID.

Annex III Training and Technology Transfer Materials Produced and Distributed through FDI-II

Publication	Number distributed	Year	Type of intended message	Distribution
Wall Calendars	2,000	1988	• Fertilizer dose, use, application time and method. • Nutrient contents of NPK, Zn, S, their deficiency symptoms and use efficiency. • How to organize demonstrations.	Distributed to dealers, distributors, extension workers, BADC staff, bankers, NGOs, and many other organizations.
Wall Calendars	2,000	1994	• Nutrient percentages of different fertilizer. • Nutrient use chart by crop. • Concentrations of elements or oxides in some fertilizers. • Functions of nitrogen, phosphorus, potash, sulfur, zinc and deficiency symptoms. • Information about DAP fertilizer. • Information about Baby Corn and Maize. • Fertilizer application.	
Agricultural Diaries	1,000	1993	• Advantages of DAP fertilizer. • How to use DAP fertilizer. • How to use urea with DAP. • Fertilizer use by crop and product. • Important fertilizer terms. • Fertilizer consumption in the world. • Annual sales of fertilizer. • Nutrient deficiency symptoms in crops. • Some basic agricultural information about Bangladesh.	Distributed among fertilizer dealers, distributors, importers, Extension workers, bankers, NGOs.
Agricultural Diaries	1,500	1994	• Technical information on DAP. • Nutrient deficiency symptoms. • Fertilizer terms and definitions. • Concentrations of elements or oxides in fertilizer.	
UDP Technology Posters	7,000	1988 and 1990	• Why use USG ? • How to use USG • Pictorial presentation of UDP techniques including rice plots with UDP and without UDP	Distributed among farmers during demonstrations organized by FDI-II.
MP Posters	50,000	1990	• Whether product is red or white does not matter • Same nutrient content • Same efficiency	Distributed among dealers, distributors, farmers, extension workers to show that the color of the product bears no value. The nutrient content and use efficiency are same.
TSP Posters	5,000	1994	• Whether product is black or white does not matter • Same efficiency	Distributed among dealers, distributors, farmers, extension workers to show that the color of the product bears no value. The nutrient content and use efficiency are same.
Phosphatic Fertilizers Posters	12,000	1994	• Comparative picture of nutrient contents of phosphatic fertilizer	Distributed to DAE, distributors, dealers, farmers and others.

Annex III Training and Technology Transfer Materials Produced and Distributed through FDI-II

Publication	Number distributed	Year	Type of intended message	Distribution
Leaflets on Sulfur	10,000	1989	Importance of sulfur in crop production.	Distributed to distributors, dealers, DAE, farmers, NGOs and others.
Leaflets on DAP	100,000	1993	• Efficient use of DAP • Advantages of DAP • How to use DAP • How to use urea with DAP • Nutrient contents of some major fertilizers	Distributed among dealers, distributors, retailers, farmers and extension workers to make them aware of DAP fertilizer.
Leaflets on Contribution of Fertilizer to Increased Yield	2,000	1994	• Application of balanced fertilizer and proper dose of fertilizer	Distributed among distributors, dealers and farmers during field days and training programs.
Booklet on Integrated Crop Management Practices	250	1990	• Production practices in transplanted Aman, wheat, mustard, and maize.	Distributed to dealers and farmers.
Booklet on Maize Production Technology	500	1994	• Details about production practices, uses, and marketing of maize.	Distributed to distributors, dealers, and NGOs.
Booklet on Fertilizer Import	500	1994	Fertilizer import modalities and international fertilizer supply sources.	Distributed among distributors, bankers and government officers.
Program Brochures	10,000	1987-1990	• Planning and management of fertilizer marketing. • Information about fertilizer technology. • Information on fertilizer credit.	Distributed to fertilizer distributors and dealers.
USG Brochures	10,000	1990	USG application techniques in transplanted rice.	Distributed among the farmers during demonstration organized by FDI-II to show the techniques of USG.
Program Brochures	500	1990-1993	• Procedure and modalities of fertilizer importation. • Information on world market prices of fertilizer.	Distributed to importers and distributors.
Program Brochures	200	1993	Information on plant nutrients and their role in crop production.	Distributed among distributors, dealers, and farmers to improve their knowledge on plant nutrients.
Program Brochures	700	1990-1994	Credit and ILC modalities and operations	Distributed among bankers, importers, distributors, and dealers.
Program Brochures	1,200	1990-1994	The technique of maize production and its importance in providing food nutrient.	Distributed to distributors, dealers, and farmers to acquaint them with maize production techniques.
Sticker on UDP Technology	50,000	1988	• Place USG under soil in transplanted Rice and earn more profit.	Distributed among the farmers during demonstration organized by FDI-II.
Plastic Shopping Bags with UDP Messages	50,000	1988	• Urea deep placement in T. Rice • Detailed procedure including pictorial presentation of UDP techniques.	Distributed among farmers during demonstrations organized by FDI-II.

Source: FDI-II

Annex IV Training Films Used in FDI-II Domestic Training Programs

Film	Subject	Language	Length	Messages
Making the Most of a Miracle	Fertilizer use	English and Bengali	27 minutes	This film is one of the best covering overall agriculture with emphasis on plant nutrient requirements and importance of even a small quantity of required micro nutrients. The process of making food by plants and required materials are also narrated elaborately in the film. This is a general film for those interested in basic and important issues of agriculture. Whenever this film was shown in any training, workshop or seminar, everybody appreciated the film.
Remember Me	Customer service	Bengali and English	10 minutes	This film shows the views of a customer about the services of different organizations and the reactions expressed by the customer towards the dealings with different company executives, workers, banks, departmental stores, hotel, gas stations, vehicle service centers, and airline etc. It is a guide for any company owner and executive to learn and develop customer service. The fertilizer dealers who are connected to business management, sales oriented and customers dealings are mostly benefitted observing this film.
What is Marketing ?	Objectives of marketing	Bengali and English	15 minutes	An animation film that discusses marketing strategies and product planning. The film focuses on product quality, pricing, and sales promotional activities.
Potassium for Agriculture	Potassium fertilizer	English	20 minutes	This film shows the source of potassium. Potassium is collected from various types of deposits like surface deposits as well as mining. Impure potassium is first collected and then refined by chemical processes and ultimately potassium fertilizer is prepared. Potassium has the vital role in improving yields. Potassium has the following major functions: 1) Disease resistance 2) Improvement of fruit quality 3) Helps in photosynthesis 4) Sugar translocation 5) Water efficiency. This film also shows the deficiency symptoms of potassium in different plants as well as the plant conditions in K sufficiently available soils. This film helped the dealers and farmers to know the product and benefits.
And One to Grow On	Food requirements for population growth	English	20 minutes	This film started with the increasing demand for food due to population growth. How is the requirement for increased food to be met. Solutions are discussed by experts in agriculture. The discussions center on adoption of (a) good seed of high yielding variety, (b) proper and timely application of fertilizers, and (c) Technology transfer. This is a very good film for policy level persons, planners, and senior executives of agriculture departments and researchers.

Annex IV Training Films Used in FDI-II Domestic Training Programs

Film	Subject	Language	Length	Messages
Planning and Goal Setting	Planning	English	20 minutes	This film discusses setting goals and executing plan programs. It is useful for imparting training to planners, managers, executives, and management personnel of any company. For planning and setting goals of a company or any organization, specific priorities and strategies are to be known first for good planning. This planning will help the companies and organizations to achieve objectives and fulfilling goals. This film contents are very useful for any organization.
The Professional	Keys of salesmanship	English	30 minutes	The film shows a sales professional searching for the principles that will advance his career. It is one of the best training films for new comers in sales profession.
The Challenge of Objections	Sales training	English	28 minutes	A touch of humor and irony highlights the serious look into the problems, frustrations and challenges of sales. The actors portrayed a storekeeper and a customer buying a product called the Sales Game. The game shows some typical but very real objections. The same kind of objections the salespeople hear everyday. "The Challenge of Objections" teaches the sales force how to identify new objections and turn them into sales. They gain perspective about their jobs and improve sales that result in new levels of performance for every person on the sales staff. This film is fit for sales force development training program as well as for any marketing course.
Ask for the Order to Get It	Sales closing	English	30 minutes	This film is acclaimed as one of the most effective sales training films ever made. This film shows a key principle of successful salesmanship. To get an order, one must ask for it. To help sales and overcome the crippling state of mind, Joe Batten explains his "3-D" concept of being a tough-minded salesperson and shows how to use five closing techniques. The salespeople not only learn what to do and say, but see for themselves how to do it.
Dhan Sabuj Sapna	Social impact of fertilizer use	Bengali	15 minutes	It is a fertilizer drama which shows the impact of fertilizer use on social life of two farmers. A marriage was arranged between the son and the daughter of two farmers. One farmer used fertilizers and got good yields and ultimately he could easily generate money for the marriage of his son. The other farmer who did not use fertilizer could not harvest good crop and fell into a great anxiety to arrange money for the marriage of his daughter. Thus, he decided to use fertilizers in the future to get a good crop.

Source: FDI-II

Annex V Details on External Training Conducted through FDI-II

Training Program	Location	Duration	Number of participants by organization
18th IMC International Management Seminar	USA	July 10 - August 3, 1988	MOA 1 BADC 1
Fertilizer Marketing Training Program	Thailand	November 18 - December 9, 1988	BADC 4
Study Tour on Dealer Training Development	USA and Thailand	January 21 - March 8, 1989	BADC 1
Agro-Industrial Project Analysis Training Program	USA and Thailand	July 17 - September 4, 1989	BADC 2
Fertilizer Marketing Management Training	USA and Thailand	August 14 - October 25, 1989	MOA 2 BADC 4
Fertilizer Marketing Training Program	Singapore	December 4 - 15, 1989	Distributor 2
Special Training Program: Administration of Commercial Credit for Fertilizer Sector Dealers for Bangladesh	USA and Thailand	February 19 - March 16, 1990	Bankers 13 IFDC 1
Training Program - Advance in Fertilizer and Irrigation Technology	USA	June 11 - 29, 1990	MOA 2
Training Program on Administration of Commercial Credit for Fertilizer Dealer in Bangladesh	USA and Thailand	July 2 - 26, 1990	Bankers 8 IFDC 1 (Interpreter)
Fertilizer Marketing Management Training Program	USA	August 3 - 16, 1990	BADC 2
Study Tour of Executives of Private Sector Commercial Bank	USA and Thailand	November 6 - 19, 1990	Bankers 3
Fertilizer Marketing Management Training Program	USA	January 3 - 23, 1991	Distributor 9
Chief Executive Invitational Study Tour	USA and Thailand	March 4 - 21, 1991	Bankers 7
Study Tour on Commercial Credit	USA and Thailand	September 15 - October 9, 1991	Bankers 9 MOA 1
Study Tour Program of Senior Policy Maker of MOA	USA and Thailand	September 17 - October 9, 1991	MOA 1
Fertilizer Distributor Study Tour	USA and Thailand	October 15 - 31, 1991	MOA 1 Distributor 12 IFDC 1 (Interpreter)
Training Program on Commercial Credit Administration and International Finance	USA	April 23 - May 16, 1992	Bankers 10 IFDC 1 (Interpreter)
Study Tour for Agribusiness Entrepreneurship Development and Training	USA and Thailand	June 17 - July 14, 1992	Distributor 10 IFDC 1 (Interpreter)
Efficient Marketing Management of Fertilizer and Other Agricultural Inputs	USA	August 3 - September 9, 1992	Government Sector 2 Corporation 3
Executive Invitational Study Tour	USA	September 17 - October 7, 1992	Government 1
Fertilizer Marketing Training Program	Indonesia	December 7 - 18, 1992	Government Sector 4 Corporation 4 Bankers 2

Annex V Details on External Training Conducted through FDI-II

Training Program	Location	Duration	Number of participants by organization
Agribusiness Development, Investment and Financial Management - Seminar and Study Tour (Phase - I)	USA and Thailand	January 24 - February 27, 1993	Bankers 5 Distributor 5 IFDC 1 (Interpreter)
Agribusiness Development, Investment and Financial Management - Seminar and Study Tour (Phase - II)	USA and Thailand	February 20 - March 28, 1993	Banker 6 Distributor 6 IFDC 1 (Interpreter)
Study Tour on Agribusiness Operation and Role of Agribusiness in Economic Development	USA and Thailand	March 17 - April 20, 1993	MOA 1 IFDC 1 (Interpreter)
Invitational Study Tour on Agribusiness Development	USA	April 17 - May 2, 1993	MOA 1
Seminar and Study Tour Program on Agribusiness Credit and Financial Management Policies	USA and Thailand	May 26 - June 20, 1993	Govt. Bank 2 Private Bank 2 MOA 1
Efficient Marketing Management of Fertilizer and other Agri-Inputs	USA	August 2 - September 3, 1993	MOA 2 BCIC 1 IFDC 1
Training Program on Fertilizer Marketing	Thailand	December 6 - 17, 1993	MOA 2 BCIC 2 MOI 1 MOP 1 Private Bank 2 Fertilizer Distributor 1 IFDC 1 (Interpreter)
Invitational Study Tour on Agribusiness Planning, Development and Commercial Financing	USA	February 24 - March 11, 1994	MOA 1 MOF 1
Study Tour Program on the Working of the FAI and it's Activity	India	February 27 - March 11, 1994	MOA 2 Chairman,BFA 1 IFDC 2 (Interpreter 1)
Seminar and Study Tour Program on Agribusiness Development	USA and Thailand	April 3 - May 3, 1994	MOA 1 NBR 1 Fertilizer Distributor 3 IFDC 1 (Interpreter)
Study Tour Program on Strategic Planning in Fertilizer Marketing Management	USA	May 15 - 30, 1994	MOI 1 BCIC 1
Study Tour Program on Environmental Issues Related to Fertilizer	USA	May 25 - June 1, 1994	BCIC 5 IFDC 1 (Interpreter)

Source: FDI-II

Annex VI Training Programs Sponsored by Private Sector Distributors and Dealers

Title of Training Program	Date	Location	Number of Participants by Organization		Sponsors
Dealers Development Training Program	June 23, 1993	Thana Parishad Bhaban, Brahmanbaria	Distributors and Retailers NGOs Bankers BCIC	75 2 3 1	M/s. Amin Traders Fertilizer Distributor, Brahmanbaria.
Dealers Development Training Program	August 17, 1993	Rotary Bhaban, Chandpur	Distributors and Retailers Bankers Chamber of Commerce	100 4 3	M/s. Rahman Corporation, Chandpur
Dealers Development Training Program	September 14, 1993	BDS Bhaban, Barisal	Distributors and Retailers NGO Bankers GKF	80 1 2 2	M/s. Khan Enterprise, Khatpatti Road, Barisal
Dealers Development Training Program	October 17, 1993	Noapara Institute, Noapara	Distributors and Retailers	60	M/s. United Traders, Noapara, Jessore
Dealers Development Training Program	November 23, 1993	Parjatan Motel, Bogra	Distributors and Retailers	53	M/s. Alhaj Moazzem Hossain, Bogra
Dealers Development Training Program	November 30, 1993	Thana Parishad Bhaban, Bhairab	Distributors and Retailers	64	M/s. Eusof and Company, Bhairab
Dealers Development Training Program	December 28, 1993	BCIC Conference Room, Brahmanbaria	Distributors and Retailers BCIC	62 8	M/s. Jahangir Alam Bhuyian, Ashuganj, Brahmanbaria
Dealers Development Training Program	January 1, 1994	Zilla Parishad Bhaban, Gaibandha	Distributors and Retailers	53	M/s. Alhaj Mozammel Hossain, Gaibandha
Dealers Development Training Program	April 6, 1994	DANIDA Training Center, Maijdi, Noakhali	Distributors and Retailers Bankers DAE	85 2 1	M/s. Salahuddin Ahmed, Chowmuhani, Noakhali
Dealers Development Training Program	April 30, 1994	Noapara Institute, Noapara	Distributors and Retailers	100	M/s. Matiur Rahman, Noapara, Jessore
Dealers Development Training Program	May 12, 1994	Zilla Parishad Bhaban, Dinajpur	Importers, Distributors and Dealers DAE	70 1	M/s. Agro Services Ltd. Pulhat, Dinajpur
Dealers Development Training Program	May 17, 1994	Hotel Polash, Sylhet	Distributors and Dealers NGO Others	67 4 9	M/s. Mesbah Trading, Sylhet
Dealers Development Training Program	May 29, 1994	Noapara Institute, Noapara, Jessore	Distributors and Dealers	75	M/s. Bothers Corporation, Noapara, Jessore

Source: Private sector.

Note : All programs focused on training about inventory planning, sales promotion, customer service, fertilizer marketing, plant nutrients, and related topics.

Annex VII Procurement and Sales of DAP by Month from February, 1993 to June, 1994

Month	Procurement	Opening stock	Sales	Closing stock
	MT			
February, 1993	32,522	32,522	197	32,325
March		32,325	144	32,181
April		32,181	523	31,658
May		31,658	809	30,849
June		30,849	337	30,512
July		30,512	788	29,724
August		29,724	1,008	28,716
September		28,716	1,474	27,242
October		27,242	795	26,442
November		26,447	3,769	22,678
December, 1993		22,678	4,706	17,972
January, 1994		17,972	8,689	9,283
February		9,283	5,232	4,051
March		4,051	1,055	2,996
April		2,996	375	2,621
May		2,621	195	2,426
June, 1994		2,426	589	1,837

Source: FDI-II
Note : Manifest quantity was 33,000 MT but 32,522 MT was received.

Annex VIII Number of Demonstration Plots Organized through FDI-II

Year	Crop	Nature of Demonstrations	Number of Demonstrations through		
			Private sector (including NGOs)	BADC and DAE	Total
1988-1989	Wheat	NPKSZn		45	45
	Transplanted Aman	NPKSZn		45	45
	Boro	UDP		57	57
1989-1990	Boro	UDP		170	170
	Transplanted Aman	UDP		56	56
	Transplanted Aman	Zinc and Sulphur		45	45
	Wheat	Zinc and Sulphur		45	45
1990-1991	Boro	UDP	41	119	160
	Transplanted Aman	UDP	27	15	42
	Transplanted Aman	NPKSZn		13	13
	Maize (Rabi)	NPKSZn		12	12
	Maize (Rabi)	Varietal trial	10		10
	Wheat	NPKSZn		13	13
	Mustard	NPKSZn		17	17
	Maize (Kharif)	Varietal trial	4		4
1991-1992	Transplanted Aman	UDP	7	15	22
	Boro	UDP	3	14	17
	Maize (Rabi)	Varietal trial	10		10
1992-1993	Transplanted Aman	UDP	50	10	60
	Transplanted Aman	Fertilizer demonstration (DAP vs TSP)	9	11	20
	Boro	UDP (TSP vs control MP vs compost)		4	4
	Boro	Fertilizer demonstration (DAP vs TSP, TSP vs control MP vs compost)	10	2	12
	Baby Corn	Baby corn trial	3		3
	Maize (Rabi)	Varietal trial	6		6
	Maize (Rabi)	OFT	4		4
	Vegetable	Varietal trial	1		1
1993-1994	Transplanted Aman	Fertilizer demonstration (DAP vs TSP, TSP vs control MP)	13	7	20
	Boro	Fertilizer demonstration (DAP vs TSP, TSP vs control MP)	5	60	65
	Maize (Rabi)	Fertilizer trial	9		9
	Maize (Rabi)	Varietal trial	7		7
	Maize (Rabi)	OFT	4		4
Total			223	775	998

Source: FDI-II

Annex IX Field Days Organized through FDI-II

Fiscal year	Number of field days	Demonstration crops	Participants		
			Number of Farmers	Fertilizer dealers and traders	Total
1988-1989	20	Wheat	1,945	858	2,803
	12	Transplanted Aman	1,343	658	2,001
1989-1990	8	Transplanted Aman (UDP)	1,660	435	2,095
	2	Transplanted Aman (Zn and S)	196	85	281
1990-1991	7	Boro (UDP)	1,295	518	1,813
	6	Maize	1,068	162	1,230
1991-1992	6	Transplanted Aman	3,973	727	4,700
	6	Boro (UDP)			
1992-1993	11	Transplanted Aman	2,670	312	2,982
	2	Baby Corn and Vegetables			
1993-1994	3	Maize	651	92	743
Total	83		14,801	3,847	18,648

Source: FDI-II

Note : The number of participants in the demonstration programs of 1991-1992 Boro (UDP) and 1992-1993 baby corn and vegetables were large, but not shown in this Annex.

Annex X List of the Reports Published through FDI-II

Report	Objectives	Type of Information and Recommendations	Decisions Facilitated	Users	Remarks
REGULAR REPORTS					
BADC Fertilizer Marketing Plan	To provide guidelines to BADC for fertilizer marketing and distribution on a continuous basis.	• Training plan for BADC staff. • Training plan for BADC appointed dealers. • Credit supply plan. • Fertilizer sales of the previous year. • Fertilizer procurement plan and sales projection by PDP and TDP. • National stock.	• Adjust production, importation and transportation. • Arrange training program for BADC staff and dealers. • Close inactive PDPs.	MOA, BADC, BCIC, factories, and distributors	This report was produced for two years, 1987-1988 and 1988-1989. Afterward it was discontinued with the transfer of fertilizer marketing to the private sector.
Monthly PDP Minimum Lifting Pilot (MLP) Program Monitoring Reports	To monitor the impact of minimum lifting requirements of PDPs recommended by IFDC.	• Stock levels at PDPs. • Distributors purchasing from PDPs. • PDP sales. • Reduced storage cost.	• Encourage more wholesalers to distribute fertilizer. • Take action to remove specific constraints to efficiency. • Wholesalers increased their investments by enlarging fertilizer storage capacity.	BADC, MOA, and distributors	Publishing this report ceased after opening of TDPs and closure of PDPs.
Monthly TDP Monitoring Reports and Monthly Monitoring Report on Fertilizer distribution	• To report the progress of implementation of the project. • To identify constraints in accelerating private sector participation in fertilizer distribution. • To report overall requirements for data for the Management Information System of MOA.	• Adequacy of supplies at TDPs. • Complains regarding TDP operation. • Aggregate fertilizer sales. • Sales by product. • Stock level at the public and private sector. • Market share of private sector. • Fertilizer importation. • Fertilizer production and sales from BCIC factories. • International price of fertilizer.	• Adjust production and imports. • Adjust export of urea. • Remove obstructions to smooth operation of TDPs and private sector fertilizer business. • Increase number of dealers at TDPs and prevent collusion. • Deal immediately with any subjects of complaints. • Improve private sector efficiency.	BADC, BCIC, USAID, MOA, distributors, dealers, and other donors	This report was initially titled "TDP Monitoring Report". With the gradual transfer of fertilizer sector from BADC to private sector, the title changed and was renamed "Monitoring Report on Fertilizer Distribution".

Annex X List of the Reports Published through FDI-II

Report	Objectives	Type of Information and Recommendations	Decisions Facilitated	Users	Remarks
Farm-level Fertilizer Price and Availability Survey	• To keep the policy makers, donors and others concerned informed about the influence of policy changes on farm-level prices of fertilizer, availability and fertilizer use. • To strengthen and widen the monitoring activities with greater private sector participation.	• Fertilizer availability. • Farm-level fertilizer prices (inter district comparison). • Output prices received by farmers. • Technical advice provides by fertilizer dealers. • Gender disaggregated data on agricultural labor. • Reduced marketing cost. • Constraints impeding greater private sector participation.	• Shift more fertilizer of required type to a region, if shortages or high prices are reported in that region. • Increase number of local dealers. • Take actions to remove specific constraints to private sector efficiency.	MOA, BADC, BCIC, USAID, distributors, dealers, and other donors	This report was widely used by the researchers to conduct quantitative analysis on fertilizer related issues.
Monthly Crop Monitoring Report	To provide information about crop conditions.	• Crops in the field. • Input use by crop. • Expectations about the crop production.	• Motivated farmers. • Increased use of fertilizer.	IFDC	This report was completed by STC between July, 1990 and July, 1991.
Monthly Statement of Credit to Fertilizer Distributors	To apprise the suppliers about credit provided to the fertilizer sector.	• Funds loaned to distributors. • Refinancing by Bangladesh Bank. • Loan recovery rate.	• Adjust rate of application of FDI-II credit funds. • Take measures against arrears. • Concentrate support activities in areas of high use growth.	Bangladesh Bank, scheduled banks, distributors, and USAID	This report started in July, 1990.
Fertilizer Sales and Stock Report: BCIC Factories	To monitor fertilizer sales and exports from BCIC factories.	• Adequacy of fertilizer supplies at BCIC factories. • Fertilizer sales from BCIC factories. • Export of urea. • Stock level.	• Adjust production. • Adjust export of urea. • Remove obstructions to smooth operation of BCIC factories.	BCIC, MOA, MOI, and USAID	This report was produced from April 1, 1993 on a weekly basis.
Fortnightly Report on Farm-level fertilizer prices	To apprise the policy makers about the current farm-level price situation of fertilizer.	Farm-level prices of major fertilizer products by district.	Shift fertilizer to that district if price is high due to shortage of supply.	MOA, BCIC, USAID, and distributors	This report began in May, 1993 as requested by MOA.

Annex X List of the Reports Published through FDI-II

Report	Objectives	Type of Information and Recommendations	Decisions Facilitated	Users	Remarks
Fertilizer Trade Bulletin	To convey messages to the importers, distributors, and dealers about the current fertilizer sector to facilitate business information and improve efficiency in the private sector.	• Current stock of fertilizer. • Current stock level. • Wholesale prices of fertilizer. • Farm-level prices of fertilizer. • Import schedule. • International fertilizer prices. • Demand projection.	• Adjust procurement and importation of fertilizer. • Adjust domestic production and export of fertilizer. • Adjust imports. • Improve private sector efficiency.	Importers, distributors, dealers, MOA, BCIC, other government agencies, and donors	The trade bulletin was published on a fortnightly basis beginning in May, 1993.
Quarterly Progress Report	To apprise MOA and USAID on the progress of work of FDI-II highlighting selected information of an operational nature.	• FDI-II inputs, activities and achievements with the work plan. • Market development in the fertilizer sector. • Number of training under FDI-II program • Number of demonstration plots organized, media announcement and technology transfer programs. • CCP fund utilization.	• Summarize the performance of FDI-II. • Improve monitoring. • Improve the dealer development and training program. • Improve monitoring CCP. • Improve fertilizer technology transfer programs.	MOA, USAID, other donors, and IFDC	This report was prepared from the beginning of the project.
Annual Reports	To reflect achievements on various fronts of private sector fertilizer business facilitated by IFDC through implementation of FDI-II project.	• Increased fertilizer sales. • Increased fertilizer production. • Dosage of different fertilizer used by farmers. • Output-fertilizer nutrient price ratio. • Fertilizers purchased by farmers by farm-size. • Availability of fertilizer in markets. • Dealer training and technology transfer programs reaching farmers. • USAID disbursement schedule. • Assistance in fertilizer sector received from others donors. • Credit facilities provided to fertilizer traders from institutional sources. • Total FDI-II disbursement by activity.	• Continue changing the scope of work of FDI-II. • Adjust fertilizer subsidy. • Modify dealer training program. • Reduce expenditure volume. • Adjust policy and public sector involvement in the fertilizer Sector. • Increased or decreased donor assistance to fertilizer sector. • Improve DD&T and fertilizer technology transfer programs. • Improve CCP activities. • Adjust budget under FDI-II.	BADC, MOA, MOF, BCIC, Bangladesh Bank, scheduled banks, USAID, and Other donors, distributors and dealers	This report was produced from the 2nd year of the project.

Annex X List of the Reports Published through FDI-II

Report	Objectives	Type of Information and Recommendations	Decisions Facilitated	Users	Remarks
Farm-level Fertilizer Use Survey	• Assess the variability in the use of fertilizer by crops and farm-size and by region. • Assess the impact of privatized fertilizer market at the farm-level in terms of performances of yield and revenue by crop and farm-size.	• Farm characteristics, yield and input use with special reference to fertilizer use by farm-size and crop. • Ratio of fertilizer paddy prices. • Costs and returns of different crops by farm-size. Recommendations: • A more rapid pace of agricultural modernization is essential through policy changes. • Efforts to be made to grow other crops. • Farmers should be motivated to use organic manure with fertilizers to restore soil structure and fertility. • Agricultural extension through public and private sector should be directed towards technology transfer and balanced fertilizer use. • Agro-processing units and marketing facilities be created, expanded and strengthened.	• Adjust policy in the fertilizer sector. • Adopt new programs for agro-processing. • Take actions to remove constraints to crop production.	MOA, USAID, other donors, research and development study institutes	These are seasonal reports prepared on the basis of three cropping seasons starting from Boro, 1988-1989 and continued until Aman, 1991-1992.
Training Programs: Schedules, budgets and calendars, April, 1992 through August, 1994	• To promote fertilizer technology with modern agricultural practices to improve agricultural productivity through training programs. • To disseminate technology and exchange of information for the development of a free competitive market for fertilizers.	Information on internal and external training programs, program budget and promotional calendars.	Training programs organized in a planned way.	Importers, distributors, MOA, USAID, Banks, and all other concerned	This report was produced in April, 1992.

Annex X List of the Reports Published through FDI-II

Report	Objectives	Type of Information and Recommendations	Decisions Facilitated	Users	Remarks
Work Plan April, 1992 to August, 1994	• To identify the major areas of work activity for April, 1992 to August, 1994 under FDI-II. • To prepare a work plan for all units of FDI-II until August, 1994.	Information includes tasks to be done by each unit to carry out the activities from April, 1992 to August, 1994 to achieve the project objectives.	FDI-II accomplished activities according to the work plan.	MOA, USAID, and IFDC	This report was published in May, 1992.
SPECIAL STUDIES					
Fertilizer Marketing in Bangladesh : The Past, Present, and Future	• To assess the past, present, and future of fertilizer marketing in Bangladesh. • To improve fertilizer marketing and distribution system.	• Information includes fertilizer marketing system, policy, supply and distribution, fertilizer use, fertilizer credit, dealer development and training. • Major recommendations were: - To improve the fertilizer marketing and distribution system through: reduce marketing constraints, lowering fertilizer delivery cost, increased fertilizer availability in all areas and increase opportunities for greater competition at all levels. - Creation of additional fertilizer storage.	• Reduced private sector marketing constraints. • Lowering fertilizer delivery cost. • Increased fertilizer availability. • Increased opportunities for grater competition at all levels. • Additional fertilizer storage created in the private sector.	BADC, MOA, USAID, Private distributors, and dealers	This report was published in June, 1987.
Study on Minimum Lifting Requirements from PDP's	To examine some traits of fertilizer wholesale dealers and recommend minimum lifting quantities from BADC sales outlets.	• The report consists of information on fertilizer dealers, fertilizer transport, and fertilizer lifting. • The report recommended - availability of credit on an equitable basis to fertilizer dealers financing. - Minimum lifting fertilizer by a wholesale dealer from PDPs. - Providing intensive training to dealers.	• Fixing the minimum lifting quantity of fertilizers by the private dealers from the PDPs. • A portion of the storage and distribution function transferred to the private sector. • Fertilizer credit made available to the private dealers.	BADC, MOA, USAID, and private dealers	This report was produced in June, 1987.

Annex X List of the Reports Published through FDI-II

Report	Objectives	Type of Information and Recommendations	Decisions Facilitated	Users	Remarks
Technique of Minimizing Transportation Cost	To assess how to minimize the variable cost, mainly transportation cost of fertilizer by applying cost saving devices and techniques to reduce the overall cost of fertilizer distribution and marketing.	Two transportation cost minimization techniques proposed: (a) the linear program approach, and (b) the differential cost approach.	BADC designed a least cost routing system as an application of modern techniques to bring the transport cost to an optimum level.	BADC, MOA, and BDG	This report was prepared in 1987.
Study on Further Reduction of Primary Distribution Points and Opening of Transportation Discount Point Program	• To assess the impact of TDP on nearby PDPs. • To assess the cost reduction by BADC due to reduction of PDPs. • To ascertain the extent of manpower and logistics which will be surplus due to reduction of PDPs. • To develop a data base for further reduction and adjustment of PDPs. • To recommend organizational optimization based on the new concept of TDP.	• TDP should be opened immediately on permanent basis. • Additional discount may be provided from the TDPs as indicated in the study. • TDPs should be staffed as per proposal. • Expanded in-kind credit should be initiated to match minimum procurement levels. • PDPs under TDP serviced area should be closed in a phased manner. • A detail study should be designed to determine alternative employment opportunities for surplus staff resulting from PDP closure. • TDP activities should be monitored on a day by day basis for adjustment of discounts, solving problems that may occur and to phase out the further closing of PDPs.	• TDP system developed as a more cost effective system of fertilizer operation in Bangladesh. • A strong private sector competitive fertilizer marketing network developed. • An efficient free market customer system developed. • Sales increased under the TDP system as a result of increased market expansion. • Transportation cost reduced.	BADC, MOA, USAID, and private dealers	This report was published in April, 1987.

Annex X List of the Reports Published through FDI-II

Report	Objectives	Type of Information and Recommendations	Decisions Facilitated	Users	Remarks
Management Information System for the Bangladesh Fertilizer Sector	To develop a management driven information system to facilitate project implementation, decision making, policy development and reform, and thereby improve fertilizer distribution and consumption in Bangladesh.	This report recommended to develop a monitoring and evaluation system for FDI-II with the generation of a great deal of information on the impact.	An MIS system was developed through FDI-II.	IFDC, MOA, BCIC, MOI, Bangladesh Bank, Commercial Banks, USAID, and other donors.	This report was prepared in March, 1988.
Fertilizer Demonstration Plot Program for Wheat (1987-1988)	• To identify appropriate methods as to how to conduct demonstration plot program on wheat production practices. • To increase wheat production in Bangladesh.	• Application method of fertilizer in wheat. • Results of demonstration plots. • Appropriate quantity of fertilizer to be used in wheat crop.	Improved yields of wheat by using increased fertilizer.	Fertilizer dealers and farmers.	This report was published in June, 1988.
Assessment of Fertilizer Marketing from Baghabari TDP, February and March, 1988	• To develop profiles of wholesalers purchasing fertilizers from Baghabari TDP. • To describe marketing patterns of wholesalers. • To determine the costs of wholesaling of fertilizers from Baghabari. • To estimate the margins between cost of delivery of fertilizer to Upazila center and farmer costs. • To recommend strategies for the improvement of the marketing system.	• Supply of appropriate fertilizer should be improved. • To increase the number of lifting points at Baghabari and use Nagarbari as a satellite TDP.	• BADC saved Tk.3.26 million by marketing of fertilizer through the Baghabari TDP rather than from the PDP. • Improved communications between the TDP's and other points.	MOA, BADC, and private dealers	This report was produced in June, 1988.

Annex X List of the Reports Published through FDI-II

Report	Objectives	Type of Information and Recommendations	Decisions Facilitated	Users	Remarks
Urea Deep Placement Demonstrations, Boro 1987-1988	• To apprise about the benefit of UDP compared to split broadcast applications of urea. • To summarize the UDP demonstration programs.	• Yield increased in UDP plots. • Positive reaction about UDP. • Methodologies for applying UDP.	MOA, dealers, and farmers.	MOA, dealers, and farmers	This report was prepared in July, 1988.
Operational Procedures for the Commercial Credit Program for Fertilizer Dealers	• To support the banks in expanding credit to the private sector. • To increase availability of institutional credit exclusively for fertilizer marketing.	An operational procedure for commercial credit program developed.	A commercial credit program for meeting working capital requirements of the fertilizer distributors and dealers implemented.	MOA, Bangladesh Bank, PCBs, NCBs, distributors, and importers	This report was published in July, 1988.
Gypsum Marketing in Bangladesh	To provide insight about gypsum marketing in Bangladesh.	• Sales by region and distribution of gypsum. • Tracking the movement and transfer of ownership of gypsum. • Costs and margins from factory to farmers.	• Increased use of gypsum at a rapid rate but from a very low base. • Closed the gap between estimated requirements and sales. • Promotional activities expanded.	MOA, BADC, BCIC, and fertilizer dealers	This report was prepared in September, 1988.
Least Cost Routing (1988-1989)	To minimize expenses of BADC through improved planning.	Provides various tables concerning fertilizer stock by PDP and estimates excess costs due to diversion of routes by BADC.	Decreased cost of fertilizer distribution through improved management and planning.	BADC and MOA	This report was published in February, 1989.

Annex X List of the Reports Published through FDI-II

Report	Objectives	Type of Information and Recommendations	Decisions Facilitated	Users	Remarks
Policy Options for the Government of Bangladesh, TSP Complex	• To determine under what conditions phosphate can be produced profitably and competitively with imported product. • To identify the most appropriate phosphates mix for CTSPC. • To evaluate the potential to privatize CTSPC. • To estimate the economic and social impact of the plant closure.	Recommendations were as follows: • The sector must have a favorable economic environment and be relatively free from government intervention. • The state owned enterprise (SOE) must have a positive cash flow. • There must be political will to make privatization succeed. • To establish a clear strategy for full sector development. • Training programs needed that will allow the CTSPC employees to continue to make a contribution to the Bangladesh economy.	Full deregulation of the fertilizer sector including relaxation of controls on foreign exchange, fertilizer imports, fertilizer prices and full removal of fertilizer subsidies.	USAID, BCIC, MOI, ERD, MOA, MOF, private importers, and distributors	This report was published in April, 1989.
A Socio-Economic Study of the Perception and Attitudes of Bangladesh Rice Farmers about the Deep Placement of Urea	• To apprise about the perceptions and attitudes of rice farmers especially, small rice farmers about the urea deep placement practice. • To increase public awareness about transferring UDP technology to farmers.	The report recommended the following: • USG sales to farmers without proper training may jeopardize the reputation of USG technology. • UDP technology should be prudently expanded. • Demonstrations be marked with a highly visible and colorful signboards that describe the UDP picture and clearly state the increased production realized by the farmers during last demonstrations. • The creation of model UDP centers is also recommended.	• Transfer of UDP technology to farmers. • Training to farmers on UDP technologies through demonstrations. • Improved training programs through demonstrations.	IFDC, MOA, dealers, and farmers	This report was published in June, 1989.
Assessment of Port Loss (1983-1984 to 1987-1988)	To assess the port losses of BADC showing the differences between manufacturing quantity, survey short landing of different types of fertilizer.	• Prices of imported fertilizer, source of finance, country of origin, port of loading, shipment date. • Port losses of fertilizer handled by BADC.	• Public sector inefficiency in handling imported fertilizer shown. • Allowed import of fertilizer by the private sector.	BADC, MOA, USAID, other donors, and private sector importers	This report was published in 1989-1990.

Annex X List of the Reports Published through FDI-II

Report	Objectives	Type of Information and Recommendations	Decisions Facilitated	Users	Remarks
Minimum Lifting Requirements : An Evaluation	• To enlarge the size of fertilizer operations. • To encourage the wholesalers to take advantage of new opportunities. • To mitigate the constraints related to fertilizer marketing.	• Fertilizer operation. • PDP customer profile. • Minimum lifting requirement to promote a competitive free market sector in fertilizer distribution and marketing.	• Wholesalers start to expand market areas. • Increased investment and decreased transportation cost. • Increased quantity of fertilizer procured from PDPs.	BADC, MOA, USAID, distributors, and dealers	This report was prepared in August, 1989
TDP Customer Study - Baghabari Vol. I and II	To provide analytical and evaluative statement on the Baghabari TDP in terms of dealer profiles, marketing issues including cost and level of discount and needed adjustments.	Information included: • educational attainment of the dealers, geographical distribution, management of marketing status, storage facilities, source of funding of TDP dealers, credit facilities and availability of the fertilizer. • various constraints, marketing patterns, and wholesaler profiles are summarized in this report.	• Ensuring delivery. • Linking lean season lifting to peak season delivery with appropriate purchase criteria for each season. • Increasing minimum purchases. • Direct purchases from factories.	BADC, MOA, and private dealers	This report was published in August, 1989.
TDP Customer Study - Shiromoni Vol. I and II	To provide analytical and evaluative statement on the Shiromoni TDP in terms of dealer profiles, marketing issues including cost and level of discount and needed adjustments.	Information included: • Educational attainment of the dealers, geographical distribution, management of marketing status, storage facilities, source of funding of TDP dealers, credit facilities, and availability of the fertilizer. • Various constraints, marketing patterns, and wholesaler profiles are summarized in this report.	• Ensuring delivery. • Linking lean season lifting to peak season delivery with appropriate purchase criteria for each season. • Increasing minimum purchases. • Direct purchases from factories.	BADC, MOA, and private dealers	This report was published in August, 1989.

Annex X List of the Reports Published through FDI-II

Report	Objectives	Type of Information and Recommendations	Decisions Facilitated	Users	Remarks
TDP Customer Study - Narayanganj Vol. I and II	To provide analytical and evaluative statement on the Narayanganj TDP in terms of dealer profiles, marketing issues including cost and level of discount and needed adjustments.	Information included: • Educational attainment of the dealers, geographical distribution, management of marketing status, storage facilities, source of funding of TDP dealers, credit facilities, and availability of the fertilizer. • Various constraints, marketing patterns, and wholesaler profiles are summarized in this report.	• Ensuring delivery. • Linking lean season lifting to peak season delivery with appropriate purchase criteria for each season. • increasing minimum purchases. • Direct purchases from factories.	BADC, MOA, and private dealers	This report was prepared in September, 1989.
TDP Customer Study: Summary Report	To provide an evaluative analysis of four TDPs namely Baghabari, Narayanganj, Shiromoni and Parbatipur in terms of dealer profiles, marketing issues including cost and level of discount and needed adjustments.	Information included: • Educational attainment of the dealers, geographical distribution, management of marketing status, storage facilities, source of funding of TDP dealers, credit facilities, and availability of the fertilizer. • Various constraints, marketing patterns, and wholesaler profiles are summarized in this report.	• Ensuring delivery. • Linking lean season lifting to peak season delivery with appropriate purchase criteria for each season. • Increasing minimum purchases. • Direct purchases from factories.	BADC, MOA, and private dealers	The report was published in October, 1989.
Low Cost Intervention Study for Fertilizer Market of Bangladesh. November, 1989	To review and ascertain: • the impact of direct procurement of urea from the factories on BADC operations. • best cost effective intervention method. • number of required sales centers and stock levels to be maintained in each center.	• Direct sales of TSP from CTSPC should be started as soon as possible. • Of the 60 PDPs in operation, 45 should be closed immediately. • Remaining 15 PDPs may temporarily continue for some months before final closing. • The closed PDPs should be transferred to Ministry of Food. • BADC should maintain TSP and MP stock equivalent to 20% of the 3 months moving average national demand only for one year time. • Plans to allow privatize imports of TSP, MP and other fertilizers should be implemented without delay.	• Allowing direct procurement of TSP from CTSPC. • Closure of PDPs and TDPs. • Transfer of fertilizer warehouses to Ministry of Food, private parties, and companies. • Allowing direct import of fertilizers by the private sector. • No intervention stock maintained by BADC.	BADC, GOB, MOA, USAID, private distributors, and other donors	This report was prepared in November, 1989.

Annex X List of the Reports Published through FDI-II

Report	Objectives	Type of Information and Recommendations	Decisions Facilitated	Users	Remarks
Urea Deep Placement Project in Bangladesh	To apprise about the progress of UDP demonstrations.	• Benefits of UDP technology. • Techniques tried. • Results of demonstrations. • Farmers perceptions and attitudes. • Develop low cost briquetting machine for UDP. • Future plan for UDP demonstrations.	Transfer of UDP technology.	MOA, dealers, and farmers	This report was published in October, 1989.
Private Sector Import of Fertilizer in Bangladesh	• To examine current regulations and operating procedures for import of fertilizers. • To formulate changes needed to permit the private sector to freely import fertilizers. • To evaluate current fertilizer pricing policy including subsidy issues. • To recommend policies and procedures enabling free and competitive private sector import of fertilizer.	Recommendations were as follows: • The import policy order 1989-90 should be immediately amended allowing private sector import of all fertilizers. • ERD and MOA should start negotiation with major donors to secure necessary changes in donor regulations to enable private sector import. • Government should establish procedures for determination, payment, and adjustment of subsidy differential. • Subsidy should be withdrawn in a phased manner by December, 1991. • BADC will remain involved in fertilizer imports during the period of transition. • Fertilizer regulations needed to govern production,import, sale, distribution, and use of fertilizer. • To foster competition a fertilizer importers and distributors association should be established.	• Import of fertilizer by the private sector deregulated. • Determined procedures for payment to importers of the subsidy amount. • Bangladesh fertilizer association formed.	BADC, MOA, USAID, other donors, importers, and distributors	This report was published in April, 1990.
Development of a Competitive Free Market Structure for Fertilizer : IFDC Experience at Policy Reform	To apprise about the impact of policy reform in the fertilizer sector.	This report provides an overview through FDI-II of policy reforms to increase foodgrain production of the country through increased fertilizer use.	Participants and readers gained knowledge about the impact of privatization in the fertilizer sector.	Participants in the seminar.	This report was published in June, 1990 and presented at the APO-RSI Seminar on Fertilizer Policy held in Manila on July 2-6, 1990.

Annex X List of the Reports Published through FDI-II

Report	Objectives	Type of Information and Recommendations	Decisions Facilitated	Users	Remarks
Crop Cut Study : 1989-1990 Wheat Yield Estimation	• To provide preliminary and quick assessment of the food grain situation in the country. • To estimate quickly production of wheat.	• Estimated production of wheat acreage and yield. • The study recommended to increase fertilizer use and adopt modern irrigation.	• Food budget. • Future crop plan.	MOA, BBS, MOF, and USAID	This report was prepared in June, 1990.
Operational Procedures for Commercial Credit Program for Fertilizer Distributors	• To support the banks in expanding credit facilities to the private sector. • To increase availability of institutional credit exclusively for fertilizer marketing.	• An operational procedure for commercial credit developed.	• A commercial credit program for meeting working capital requirements of the fertilizer distributors and dealers implemented.	MOA, Bangladesh Bank, PCBs, NCBs, distributors, and importers	This report was produced in August, 1990.
Crop Cut Study : 1989-1990 Boro Rice Yield Estimation	• To provide preliminary and quick assessment of the food grain situation in the country. • To estimate quickly production of Boro paddy.	• Estimated production of Boro rice acreage and yield. • The study recommended to increase fertilizer use and adopt modern irrigation.	• Food budget. • Future crop plan.	MOA, BBS, MOF, and USAID	This report was published in August, 1990.
Crop Cut Study : 1990 Aman Rice Yield Estimation	• To provide preliminary and quick assessment of the food grain situation in the country. • To estimate quickly production of Aman paddy.	• Estimated production of Aman rice acreage and yield. • Recommended to increased fertilizer use and adopt modern irrigation.	• Food budget. • Future crop plan.	MOA, BBS, MOF, and USAID	This report was published in April, 1991.
Agricultural Development and Fertilizer Subsidies in Bangladesh	• To provide an analysis of the policies and issues of fertilizer use in Bangladesh, fertilizer subsidy related issues and role of fertilizer and fertilizer policies in agricultural development.	• The budgetary burden of subsidy on TSP and MP in Bangladesh should be resolved immediately. • GOB will save annually Tk.1,392 million from complete subsidy elimination on TSP and MP. • A more optimal fertilizer product mix to be imported including superior and cost effective phosphate products like DAP.	• Complete withdrawal of subsidy from TSP and MP. • Fertilizers are being procured and sold at full cost.	MOA, USAID, and private distributors	This report was published in August, 1991.

Annex X List of the Reports Published through FDI-II

Report	Objectives	Type of Information and Recommendations	Decisions Facilitated	Users	Remarks
Development of a Competitive Free Market Structure for Fertilizer in Bangladesh : IFDC Experience at Policy Reform	To apprise about the impact of policy reform in the fertilizer sector.	This report provides an overview of the activities of FDI-II policy reforms to increase food grain production through increased fertilizer use.	Participants and readers gained knowledge about the impact of privatization in the fertilizer sector.	Participants in the seminar.	This report published in September, 1991 and presented at the training-cum-workshop on policy issues affecting fertilizer sector development and sustainable agriculture.
Policy Reform in the Fertilizer Sector of Bangladesh	• To develop an open and competitive free market structure for fertilizer in Bangladesh. • To ensure the availability and reduce the scarcity and price of fertilizer.	• BADC sales centers to be reduced. • Farm-level prices to be decontrolled. • Operational efficiency of BADC to be improved. • All transportation restrictions to be removed. • Subsidy on imported TSP and MP to be eliminated gradually. • Fertilizer import to be transferred from the public sector to the private sector.	• Fertilizer transportation transferred from the public sector to the private sector by reducing BADC sales centers. • Fertilizer dealers could buy fertilizer from the factories and sell anywhere at market prices. • GOB allowed direct access to the private sector to buy fertilizer in large quantity from the factories and the ports. • GOB eliminated the uniform price policy and restrictions on movement of fertilizers.	BADC, MOA, and private distributors	This report was produced in December, 1991 and presented at the FAI Seminar held in 1991 on optimizing fertilizer food distribution usage in New Delhi, India.
Fertilizer Distributors Profile Survey (1990-1991)	To make an assessment of the dealers engaged in the fertilizer business.	• Government control on fertilizer sales, prices and marketing should be eliminated. • No licensing system to be introduced. • Customer service should be improved. • Credit facilities should be widened and made easier. • More direct purchases from factories should be encouraged.	• Restriction of fertilizer marketing was withdrawn and all constraints removed. • Customer service improved. • Number of distributors increased. • Private sector infrastructure developed. • Monopoly on fertilizer marketing removed. • Fertilizer dealers and distributors are getting more credit from banks.	MOA, dealers, and distributors	This report was published in January, 1992

Annex X List of the Reports Published through FDI-II

Report	Objectives	Type of Information and Recommendations	Decisions Facilitated	Users	Remarks
Fertilizing Materials and Regulation	To provide a regulatory measures in the interest of general public, farmers, and traders for ensuring quality of fertilizing materials for production, distribution and sales.	This is a draft regulation prepared for MOA.	Fertilizer control order is being implemented.	MOA, BDG, traders, and farmers	This report was published in April 22, 1992.
Farmers Response Survey on Granular Urea	• To determine the market acceptance of granular urea. • To know the reasons for poor sales of granular urea.	• Farmers are not fully aware of this technology. • a motivational campaign to be needed to increase the use of granular urea.	• Conduct more training programs on granular urea. • Improved physical facilities in factories to reduce cost. • Extension network strengthened.	IFDC, BCIC, MOA, and DAE	This report was produced in July, 1992.
Fertilizer Subsidy Removal in Bangladesh : An Assessment of the Impact on Fertilizer Use, Crop Yields, and Profits of Farmers	To assess the impact of the fertilizer subsidy removal on fertilizer use, food grain production, and farm income under the fertilizer marketing system that is emerging as a consequence of policy reform.	The study observed that: • Fertilizer and paddy price ratios are more often affected by changes in paddy prices than by changes in fertilizer prices. • The removal of fertilizer subsidy would continue to benefit BDG by reducing expenditures, but more importantly, it will promote a better allocation of resources and in the long run, a more efficient and productive agriculture.	• Fertilizers sold at full cost.	MOA, USAID, researchers, and policy makers	This report was published in May, 1993.
Proposal for a Variable Pricing Strategy for Urea from BCIC Factories	• To identify the problems in urea distribution and recommend an acceptable solution to encourage distributors in urea marketing and to keep the price at a reasonable level. • To encourage distributors to equalize monthly procurement from the BCIC urea factories.	• To mitigate the current and observed problems in urea marketing, a market oriented marketing plan including a variable pricing strategy for urea to be adopted. • To solve the problems related to urea distribution or more specifically the problem of uneven procurement from the BCIC urea factories by adopting variable pricing policy.	• A variable pricing policy is being implemented.	MOA, MOI, BCIC factories, and distributors	This report was produced in June, 1993 and recommendations are yet to be implemented by the BDG.

Annex X List of the Reports Published through FDI-II

Report	Objectives	Type of Information and Recommendations	Decisions Facilitated	Users	Remarks
Report on the Development Structure and Organization of Bangladesh Fertilizer Association (Proposed)	To develop a structure for the Bangladesh Fertilizer Association.	The report proposed the structure, TOR composition and activities of BFA.	The BFA established.	Dealers, distributors, and members of BFA.	This draft report was prepared in July, 1993.
Preliminary Food Grain Credit Assessment	• To extend commercial credit program facilities to the food grain sector. • To examine the possibilities of developing a credit delivery system.	The study recommended that: • The existing credit system to the food grain traders should be strengthened. • No new credit delivery system need to be developed.	An efficient food grain marketing system in the private sector.	Ministry of Food, IFPRI, and USAID	This report was published in March, 1994 in collaboration with IFPRI.
Summary Report on the Farm-level Fertilizer Use Study	• To summarize the findings of the farm-level fertilizer use study reports of the nine seasons. • Assess the variability in the use of fertilizer by crops and farm-size during different crop seasons. • Assess the impact of privatized fertilizer market at the farm-level in terms of performances of yield and revenue by crop and farm-size.	• Farm characteristics, yields and input use with special reference to fertilizer use by farm-size and crop. • Nutrient crop price ratios. • Costs and returns of different crops in different seasons. • Farmers should be motivated to use organic manure with fertilizers to restore soil texture and fertility. • Agro-processing units and marketing facilities be created, expanded and strengthened.	• Adjust policy and public sector interest in the fertilizer sector. • Adopt new programs for agro-processing. • Take actions to remove constraints to crop production efficiency.	MOA, USAID, other donors, and research and development study institutes	This report was published in May, 1994.
Environmental Assessment of the Ammonia and Urea Factories in Bangladesh	• To evaluate the health and safety practices of factories. • To observe operating procedures. • To suggest improvements in standards and condition under which the factories were operating.	• Establish and advertise a BCIC policy of environment excellence and quality. • Identify and quantify nitrogenous materials lost to the environment. • Develop an emergency response plan, safety manual and laboratory safety guidelines for each factory. • Reduce energy consumption.	If the recommendations are implemented: • Factory environment is protected. • Workers health and safety are protected. • Natural gas consumption is reduced.	BCIC and Urea Factories	This report was published in June, 1994

Source: FDI-II

Annex XI Databases of FDI-II

Surveys and Databases	Period
Farm-level Survey (Monthly)	From January 1986 to May 1994. * Except for the months of February 1986, May 1986 and June 1987
Farm-level Survey (Supplementary-Monthly)	November 1993 - January 1994
Survey on Fertilizer Stock (Fortnightly)	April - June 1994
Survey on Fertilizer Marketing Cost	April - June 1994
Survey on Market Information	April 1994
Survey on Poultry Farms	September 1992
Profile of Fertilizer Dealers	March 1993
Interviews with Dealers on Variable Pricing	May 1993
Monthly Survey on Dealers	August 1993 - March 1994
Farmer Survey on Boro 1993 Season	March 1993
Survey of Fertilizer Dealers	March 1993
Farm-level Fertilizer Use Survey	Aus 1989-1990, Aman 1989-1990, Rabi-Boro 1988-1989, Rabi-Bore 1989-1990, Aus 1990-1991, Aman 1990-1991, Boro 1990-1991, Aus 1991-1992, Aman 1991-1992
Survey of Farmers on Balanced Fertilizer Use	March 1994
CCP: Bank Performance (Monthly)	July 1990 - June 1994
CCP: Survey 1: For Fertilizer Distributors	August 1990 - June 1993
CCP: Survey 2: For Fertilizer Retailers	August 1990 - June 1993
Survey on Access to Credit	April - June 1994
Staff Information on BADC	December 1989
Fertilizer Stock, Sales, and Transportation Information for the year 1987-1988 and 1988-1989	September 1989
Database for monthly Bank and petty cash disbursements	April 1989 - July 1994
Employee Leave Records	April 1989 - July 1994

Source: FDI-II

Task	Time Schedule	Responsibility
Organize manpower from BADC, Department of Agricultural Marketing (DAM), Department of Agricultural Extension (DAE) and Ministry of Agriculture (MOA)	Within 90 days	MOA and IFDC
Organize a common Monitoring Cell within MOA, BADC, DAM, and DAE (including installation of hardware and software)	Within 30 days	MOA, BADC, DAM, DAE, and IFDC
Make a list of information to be collected from secondary and primary sources	Within 30 days	MOA and IFDC
Provide training for the staff of the Monitoring Cell	Within 30 days	MOA and IFDC
Start collecting data	Within 15 days	Monitoring Cell of MOA
Start producing information on a regular basis	Within 60 days	Monitoring Cell of MOA

Annex XIII Non-Expendable Items Procured Through FDI-II

Item	Number Procured	Remarks
Vehicles	32	11 PF Jeep, 6 NP Jeep, 2 NP Pickup, 1 Toyota Cresseda, 10 Korando Jeep, and 2 Proton Saga Car
Mini Bus	1	
Motor Cycles	45	
Computers	24	
Computer Batteries	21	
Printers	21	
Training Equipment	46	Includes camera, video camera, overhead, slide, movie projectors, screens, television, VCR, PA system and transparency maker.
Calculators	56	
Air Conditioners	77	
Cyclostyle Machine	1	
Photocopiers	7	
Fax Machine	1	
Typewriters	7	
Telephones	32	
Dehumidifiers	7	
Refrigerators	8	
Other equipment	173	Includes cookers, ovens, fans, charge light, lawn mowers, driers, electrical accessories, spiral binding machine, washing machines, briquiter machines.
Furniture	538	343 chairs, 39 half secretariat tables, 26 secretariat tables, 43 other tables, 13 sofas, and 74 cabinets.
Other	21	19 carpets, 1 wall clock, and 1 mirror
Kitchen ware	110	Includes plates, cups, knives, forks, spoons

Source: FDI-II

Fertilizer Distribution Improvement Project-II

Contract Number: 388-0060-HCC-8701-01

End of Project Report

March 1987 through August 1994

EXECUTIVE SUMMARY

Submitted to

The Ministry of Agriculture of Bangladesh

and

The United States Agency for International Development

by

The International Fertilizer Development Center

August 1994

A Chronology of Significant Events during FDI-II

February, 1987	Host Country Cost Reimbursement Contract between BADC and IFDC signed
March, 1987	FDI-II implementation commences
March, 1987	A manual MIS for the fertilizer sector implemented
March, 1987	The policy of transportation discount points (TDP's) implemented
July, 1987	Private sector dealer development and training programs begin
September, 1988	The MIS for the fertilizer sector is computerized with local area network
December, 1988	Fertilizer technology transfer program begins with demonstration plots
March, 1989	Government policy changed to allow direct procurement of urea from factories by the private sector
March, 1989	50:50 quota system for public and private purchases introduced
March, 1989	A novation contract signed between BADC, IFDC and MOA to substitute MOA as a party to the contract in place of BADC
April, 1989	An in-kind credit program for fertilizer dealers begins
June, 1989	Commercial credit program for private sector fertilizer dealers implemented
July, 1989	Public sector primary distribution points (PDP's) begin closing
July, 1989	Government policy changed to allow direct procurement of TSP and MP from factories and ports by the private sector
July, 1989	Transfer of BADC fertilizer warehouses begins
November, 1989	Farm-level fertilizer use studies commence
December, 1989	Government abolished the 50:50 quota system of BADC for procuring urea
July, 1990	Use of inland letters of credit for fertilizer procurement from factories begins
July, 1991	In-kind credit program abolished
July, 1991	Government policy changed to allow direct import of fertilizers by the private sector
August, 1991	Government policy changed to allow partial removal of subsidies on TSP and MP
November, 1991	Demonstration of hybrid maize cultivation in Bangladesh begins
February, 1992	Contract amended to extend FDI-II from April 1, 1992 to August 29, 1994
July, 1992	Private sector manages 100% of fertilizer imports
December, 1992	Government policy changed to discontinue public sector fertilizer distribution
December, 1992	Government policy changed to allow complete elimination of subsidies on TSP and MP
February, 1993	MIS computer hardware and software enhanced with a local area network
April, 1993	DAP sales promotion campaign begins
May, 1993	Strategic plan for urea pricing at BCIC factories submitted to BCIC
May, 1993	Assessment of the impact of fertilizer subsidy removal completed
June, 1993	Fertilizer imports at full cost by the private sector begin
June, 1993	Private sector begins to organize and finance training programs for fertilizer dealers
November, 1993	Bangladesh Fertilizer Association formed
April, 1994	Fertilizer control order submitted to MOA
July, 1994	An environmental assessment of BCIC ammonia-urea factories completed
July, 1994	Membership in Bangladesh Fertilizer Association exceeds 450
August, 1994	FDI-II closes

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ACRONYMS

ADB	Asian Development Bank
ALIGU	American Language Institute of Georgetown University
ASP	Ammonium Sulphate
ATDP	Agribusiness and Technology Development Project
BADC	Bangladesh Agricultural Development Corporation
BCIC	Bangladesh Chemical Industries Corporation
BDG	Bangladesh Government
BFA	Bangladesh Fertilizer Association
CCP	Commercial Credit Program
CCPF	Commercial Credit Program Fund
CDST	Customs Duty and Sales Tax
CIDA	Canadian International Development Association
C&F	Cost and Freight
CIF	Cost, Insurance, Freight
COP	Chief of Party
CTSPC	Chittagong Triple Super Phosphate Complex
CUFL	Chittagong Urea Fertilizer Limited
DAE	Department of Agricultural Extension
DANIDA	Danish International Development Agency
DAP	Di-ammonium Phosphate
DD	Demand Draft
DD&T	Dealer Development and Training
DGIS	Director General International Cooperation (The Netherlands)
FDI	Fertilizer Distribution Improvement
FLFUS	Farm-level Fertilizer Use Survey
FY	Fiscal Year
GDP	Gross Domestic Product
GKF	Grameen Krishi Foundation
Govt	Government
HA	Hectare
HCN	Host Country National
HYV	High Yielding Variety
IFDC	International Fertilizer Development Center
ILC	Inland Letter of Credit
JFCL	Jamuna Fertilizer Company Limited
LOP	Life of Project
MEC	Monitoring, Evaluation, and Computer
MIS	Management Information System
MOA	Ministry of Agriculture
MOF	Ministry of Finance
MOI	Ministry of Industry
MP	Muriate of Potash
MRP	Maximum Retail Price
MT	Metric Ton

NGFF	Natural Gas Fertilizer Factory
NGO	Non-Government Organization
PB	Participating Bank
PDP	Primary Distribution Point
PM&E	Planning, Monitoring, and Evaluation
PO	Pay Order
PUFF	Polash Urea Fertilizer Factory
SSP	Single Superphosphate
TA	Technical Assistance
TCCA	Thana Central Cooperative Association
TDP	Transportation Discount Point
TSP	Triple Superphosphate
TVA	Tennessee Valley Authority
UDP	Urea Deep Placement
UFFL	Urea Fertilizer Factory Limited
USAID	United States Agency for International Development
USG	Urea Super Granule
ZFCL	Zia Fertilizer Company Limited

GLOSSARY

Aman	Rice produced during late summer and fall (July through October)
Aus	Rice produced during the summer season (March through June)
Boro	Rice produced during the winter season (November through February)
District	Administrative unit in the charge of a Deputy Commissioner comprising a number of thanas
Fiscal Year	Starts from July of a calendar year and ends in June of the next calendar year
Grameen	Rural
Krishi	Agriculture
Rabi	Winter season (November through February)
Thana	Administrative unit of the local government below the district
Union	The lowest administrative unit of local government

EXCHANGE RATE

U.S.$ 1.00 = Tk. 40.00

Executive Summary

The Agriculture Sector

About 80% of the population of Bangladesh lives in rural areas and most derive a livelihood from agricultural work. The contribution of agriculture to the GDP was about 38% in 1992-1993. Crop production, mainly rice and wheat, accounts for about 80% of the annual value of agricultural production. A skewed distribution of land is evident in that about 11% of the rural households own 52% of the total cultivable land and 33% are landless.

Agriculture production in Bangladesh is adversely affected by (1) limited land resources, (2) low productivity due to traditional subsistence agriculture, and (3) climatic forces. BDG set strategies to stimulate agricultural production by assuring adequate and timely availability of irrigation, fertilizer, and improved seed. The fact that chemical fertilizers contribute substantially to food and agricultural production has been increasingly recognized and understood. The improvement in the distribution and use of fertilizer is essential for agricultural growth and development in Bangladesh.

Fertilizer Marketing

The use of chemical fertilizer was introduced in Bangladesh in the early 1950's. Until 1978, a public sector entity, BADC, was solely responsible for all procurement, transportation, storage, and distribution of subsidized fertilizers. Erratic and inadequate domestic fertilizer production, limited storage capacity, serious budget problems due to fertilizer subsidies, inefficient handling of fertilizer imports, and foreign exchange limitations impeded the marketing of fertilizers.

Starting in 1974, USAID addressed constraints of the fertilizer sector through six development projects. Between 1978 and 1983, the FDI-I was one of the pioneer projects that contributed to the development of a new marketing system to increase agricultural production by increasing fertilizer use. Technical assistance through FDI-I brought major policy changes, such as (1) withdrawal of BADC from selling fertilizers in thanas but from PDPs, (2) transfer of fertilizer transportation below PDP's to private wholesalers, (3) removal of restrictions on fertilizer trading, and (4) decontrolling retail prices. These FDI-I reforms created a competitive group of private wholesalers and dealers and resulted in a marked improvement in fertilizer availability at competitive retail prices.

The Need for FDI-II

FDI-I enabled the transfer of downstream fertilizer marketing to the private sector, but some tasks were incomplete. Continued technical assistance was necessary to fulfill the development objectives of the BDG to establish an efficient fertilizer program based on the full participation of a competitive private sector. The availability of fertilizers at reasonable prices, technical knowledge regarding fertilizer use, and the availability of working capital were identified as factors that constrained fertilizer use in Bangladesh. The FDI-II project was designed to mitigate these constraints and increase fertilizer use.

The FDI-II Project

Project Goal and Purpose

The goal of the FDI-II project was to increase agricultural production at a minimum rate of 4% annually through increased use of fertilizer. An average annual growth rate of at least 8% in aggregate fertilizer use during FDI-II was the indicator against which project accomplishments would be measured. The project included four major components:

- *Policy reform*
- *Commercial credit program*
- *Dealer development and technology transfer and*
- *Management information system.*

Project Outputs

The expected project outputs as stated in the project paper were as follows: (1) assure an adequate supply of fertilizer throughout Bangladesh, (2) provide funds to finance a fertilizer credit program for importers, distributors, and dealers, (3) develop large-scale private sector wholesalers with a potential to market fertilizers throughout Bangladesh, (4) increase efficiency in fertilizer distribution and marketing, (5) activate fertilizer dealer development and sales promotion programs, and 6) improve access to fertilizer sales outlets by the private sector.

Technical Assistance

As in FDI-I, IFDC continued to provide technical assistance in FDI-II through a level of effort type contract that included advisory services, production and distribution of sales promotional materials, training, and equipment purchases.

IFDC was contracted to provide technical assistance to MOA to establish and institutionalize private sector fertilizer marketing. This was to be accomplished through the efforts of a number of consultants with long term and short term assignments. The planned level of effort was 11,340 person-months of direct labor including approximately 256 person-months for long-term expatriates, and 11,084 person-months for local professional, technical, administrative and clerical staff. IFDC was responsible for monitoring and assisting in the implementation of a private sector national fertilizer distribution system and other FDI-II outputs including policy reform, technology transfer through training, credit, imports, and dealer development activities. IFDC also provided consultants, commodities, and training to accomplish the project scope of work.

Responsibilities of BDG

BDG was responsible to (1) oversee the progress of work, (2) facilitate prompt customs clearance of imported project commodities, (3) provide entry and exit visas to expatriate consultants, (3) appoint local counterparts, and (4) provide CDST on project equipment.

Implementation and Achievements of FDI-II

Policy Reform

Fertilizer policies formed an integral part of FDI-II in establishing a free market where the private sector could flourish. The reforms designed by FDI-II were comprehensive, complementary, and focused on fertilizer market development, subsidy removal, and the reorganization of BADC.

Fertilizer Market Development

The major policy reforms in market development included the following:

- BDG implemented the recommendation of FDI-II regarding ***creation of TDPs*** that led to a significant change in responsibility for fertilizer transportation from BADC to the private sector.

- A major FDI-II policy reform which ***allowed distributors to purchase fertilizer directly from factories*** was implemented by BDG in March, 1989. Initially, private distributors were permitted to purchase fertilizer from factories on a 50:50 quota with BADC. But this procedure was abolished by

the government. FDI-II suggested a policy of free competition in the purchase of urea from domestic factories and this reform resulted in improved availability of urea throughout the country.

- BDG ***allowed direct sales of TSP, MP, and other fertilizers from factories and ports*** in July, 1989. This provided the private sector an opportunity to expand their contribution to improved fertilizer marketing.

- To continue with the policy of fertilizer market privatization, FDI-II provided policy analyses to support the ***direct importation of fertilizer by the private sector*** and in 1991 the BDG permitted such imports. This initiative further strengthened the development of a private fertilizer sector.

- The fertilizer sector policy reforms created a situation that made all BADC fertilizer warehouses redundant. Therefore, FDI-II proposed the ***transfer of BADC fertilizer warehouses*** to other sectors of the government as well as leasing or selling these warehouses to private distributors.

Removal of Subsidy

Continuing the subsidy on TSP and MP involved price regulation and administrative intervention that was inconsistent with the development of a free and competitive market. Therefore, a major step in the process of privatization was completed on December 6, 1993 when all subsidies on fertilizers were withdrawn.

Reorganization of BADC

The involvement of the private sector in the fertilizer market required a review and restructuring of BADC. FDI-II evaluated the role of BADC and presented a plan for reorganization. FDI-II suggested phasing out the redundant staff of BADC through an attractive voluntary retirement policy. But, resistance from the employees union of BADC made it difficult for BDG to implement the recommendations.

Achievements in Policy Reform

As a result of policy reforms through FDI-II, the following characteristics of a free market for fertilizer were evident in August, 1994:

- ***The market structure underwent a radical transformation.*** A vigorous group of importers, distributors, dealers, and retailers emerged as a consequence of market reorganization.

- ***The market share of the private sector increased dramatically.*** The public sector share of the national fertilizer market decreased from 100% in 1986-1987 to less than 1% in 1993-1994.

- ***The private sector is managing the importation of all fertilizers at full cost.*** The public sector share of fertilizer imports declined from 100% in 1990-1991 to nil in August, 1994.

- ***TDP and PDP operations of BADC closed.*** As TDP operations gained momentum, eventually all PDPs were closed. The TDPs are also now redundant because private sector distributors changed procurement from TDPs to BCIC factories and imports.

- ***The effect on farm-level fertilizer prices was dramatic.*** Prices reflect intense competition in the market place, a phenomenon which encourages efficiency and yields great benefits to farmers.

- ***The private sector achieved cost efficiencies in fertilizer distribution.*** This is clearly reflected in the gross margins of the private dealers which did not increase significantly after subsidy withdrawal during 1990-1994 the gross margins ranged between only 16% and 19%.

- ***The availability of fertiiizer has been satisfactory consistently with an estimated 108,000 fertilizer retail outlets in operation.*** The improved availability of fertilizer in rural Bangladesh is further evident from FDI-II monitoring which shows that in 1986 about 41% of the Bangladeshi farmers were able to purchase fertilizer at retail shops within 5 kilometers of their farms but in 1994 that percentage improved significantly to 80%.

- ***Production and sales of fertilizer from BCIC factories increased.*** The cash flow of BCIC has improved dramatically as private sector payments are made in cash or through confirmed bank financing.

- ***Fertilizer use increased dramatically.*** Aggregate fertilizer sales during 1986-1987 to 1993-1994 increased by about 70% with an annual compound growth rate of about 8%.

- ***The Bangladesh Fertilizer Association was formed.*** This association, formed with the assistance of FDI-II, is a key factor in the institutionalization of private sector fertilizer marketing.

- ***The Fertilizer (Control) Order is essential to protect the interests of farmers and fertilizer marketers.*** A control order developed through FDI-II is now being reviewed by the government.

Credit Program

A key component of FDI-II was to provide technical assistance to improve and strengthen the capabilities of banks in providing funds to finance a fertilizer dealer credit program and fertilizer imports.

The In-kind Credit Program

During the early stages of developing private sector dealers, an in-kind credit program managed by BADC was funded through FDI-II. Of a U.S.$ 13 million soft loan, U.S.$ 3 million was used. With the rapid transition of the domestic fertilizer market from the public to the private sector, demand for in-kind credit virtually disappeared and U.S.$ 10 million for the in-kind credit was de-obligated and used for fertilizer imports.

The Commercial Credit Program

The CCP of FDI-II increased the availability of institutional credit exclusively to finance fertilizer marketing activities. This was essential to facilitate private sector investment in fertilizer marketing. The CCP started in June, 1989 and the total FDI-II CCP fund amounted to Tk.1,053 million or U.S.$ 26 million which includes original grant funds, counterpart Taka funds against import of fertilizer and the interest earned on refinance loans. The CCP fund was useful in increasing the availability of credit from banks to private distributors and dealers to finance fertilizer purchases. Initially, 14 banks agreed to participate in the CCP and follow the procedures developed by FDI-II. In June, 1994, 13 PBs, or nearly one half of all commercial banks in Bangladesh, were extending credit to the fertilizer sector through the CCP. The number of bank branches involved in lending increased from 165 to 395 between 1989-1990 and 1993-1994, despite a small decline in the number of PBs. Besides the FDI-II funds, the participating banks are now using their own funds for loans. The share of FDI-II CCP funds in the PB's fertilizer loan portfolio decreased from 78% to 41% between 1989 and 1994. The reasons for this decline may be attributed to the following:

- At present, there does not appear to be a liquidity shortage in loanable funds in the banks. Therefore, there is a low demand for the CCP funds of FDI-II.

- A mismatch between the short-term PB borrowing from the CCP (three months) and the sanction of loans (line of credit) with a longer marketing period.

- The limited capacity to make good loans has effectively constrained the demand of PB's for outside funding.

- The CCP, by providing working capital to the fertilizer distributors, helped to multiply income from the fertilizer business. This reduced dependence on institutional credit.

- The fertilizer market has not expanded during last three years as vigorously as during 1989-1990 and 1990-1991. Increases in retail prices of fertilizers due to subsidy withdrawal, a decline in crop prices, and the slow growth in the HYV area and irrigated areas contributed to the reduced growth in the fertilizer sector.

The CCP achieved a FDI-II project objective of encouraging financial institutions to provide working capital for private fertilizer traders. Moreover, the fact that the banks are using their own funds for about 59% of loans for fertilizers is clear evidence that the banks consider the private fertilizer sector viable and profitable. This is a key to institutionalization of credit in the commercial banking system. An estimate of Bangladesh Bank shows that the total fertilizer loans overdue in mid 1994 were Tk.362 million, a delinquency rate of about 24%. Although any delinquency rate is undesirable, the fertilizer loan portfolios of the banks are on average significantly better than other sectors of the economy. For example, the delinquency of loans for food grain traders is about 80%. In the case of USAID CCP funds, the loan portfolio of the Bangladesh Bank shows no delinquency problems.

One of the objectives of the CCP of FDI-II was to encourage fertilizer distributors, wholesalers, and retailers to pass credit on the next level in the market network so that credit could reach farmers. FDI-II estimated that short-term liquidity valued at 66 million (U.S.$ 1.7 million) was provided to farmers by fertilizer traders through trade credit during 1992-1993.

The Inland Letter of Credit

FDI-II proposed a new means of payment, namely the Inland Letter of Credit (ILC) for the fertilizer distributors to make payments to fertilizer factories through banks. This financial instrument was accepted enthusiastically by the distributors because it involved lower bank charges, alleviated risks in arranging cash payments, and did not block funds of distributors with BCIC for prolonged periods. The use of ILCs was a success and contributed significantly to the process of developing a free market for fertilizer in Bangladesh.

Dealer Development and Training

The dealer development and training program of the FDI-II project was essential to increase the technical knowledge and business acumen of fertilizer marketers, bankers, government officials, and farmers. The training programs were also effective in educating government officials, fertilizer businessmen, and bankers which are needed to create and maintain a private fertilizer market. The primary foci of the training programs included the following: (1) impact of policy reforms, (2) improving fertilizer use efficiency, (3) orientation programs for dealers, (4) understanding crop production technology, (5) fertilizer marketing management for dealers, (6) understanding the commercial credit program, (7) fertilizer inventory planning, (8) fertilizer importation, (9) fertilizer distribution planning, and (10) production and use of compound fertilizers.

As of June, 1994, 238 domestic training and training-cum-workshops for 11,022 participants were completed during the FDI-II project. Numerous technical pamphlets, brochures, posters, slides, and films were produced for these programs. In addition to domestic training, 193 participants from the public and private sectors participated in 33 external training programs, invitational tours, and study tours.

Different studies indicted that the training programs organized through FDI-II were effective in transferring knowledge to the participants. This was critical in the development and implementation of appropriate policy reforms, improved banking practices, improved efficiency in fertilizer importation, marketing, and improved efficiency in fertilizer use.

During 1993-1994, private sector distributors, recognizing the benefit of formal training for dealers, organized and conducted 12 training programs in collaboration with FDI-II. This demonstrates the institutionalization of training and dealer development within the private sector.

Technology Transfer

Technology transfer was an essential part of FDI-II to educate dealers and farmers about fertilizer use and to introduce high yielding crop varieties to increase profits. FDI-II used the following major tools for the dissemination of technologies: (1) technology demonstrations through BADC, DAE, NGOs, and the private sector, (2) formal training through field days and farmers' rallies, (3) technical brochures, leaflets, and other promotion materials, and (4) direct technical assistance. During FDI-II, 988 demonstrations and 83 field days were conducted.

The technology transfer activities focused on the introduction of appropriate fertilizer technologies, improved fertilizer use management, and the introduction of new crops suitable to the agroclimatic conditions of Bangladesh. Technologies used in the demonstrations included urea super granules and urea deep placement technology, hybrid maize, baby corn, proper fertilizer management practices for rice and maize, and di-ammonium phosphate (DAP) fertilizer.

The Management Information System

The MIS of FDI-II was instrumental in (1) ensuring transparency in fertilizer marketing, and (2) providing policy makers and others with improved and timely information as a basis for sound policy decision. The MIS was based on several key principles: (1) maximum use of data bases, (2) direct linkage between the data and specific policy questions, (3) supplementing of reports with briefings and policy statements, (4) automation to improve timeliness and flexibility, and (5) a phased institutionalization of the system.

The monitoring activities included collection of data on a broad range of topics including the institutional and economic aspects of fertilizer distribution, the determinants of fertilizer use, current knowledge and practices concerning fertilizer, and the profitability of fertilizer use under different circumstances. The MIS also included data on fertilizer production, imports, stocks, sales, prices, output prices, and the cost and availability of credit. The output of the MIS served as a basis for series of reports including (1) weekly reports on fertilizer production and sales, (2) fortnightly reports on farm-level fertilizer prices, (3) trade bulletins, (4) monthly farm-level fertilizer price and availability surveys, (5) monitoring reports on fertilizer distribution, (6) CCP monitoring, (7) quarterly progress reports, (8) annual reports, (9) farm-level fertilizer use studies, and (10) special studies.

FDI-II developed a system for providing informal briefings for decision makers, especially BADC, MOA and BCIC officials, and bankers that have proven quite effective. Such briefings are best regarded as problem solving sessions where FDI-II data were used to identify problems and suggest remedial actions.

FDI-II performed data and wordprocessing work manually until August, 1988. With the installation of computers in September, 1988, FDI-II began using a modern computer system that provided information processing facilities for all data collection and analysis work. The MIS work of FDI-II accelerated the flow of information which was in great demand by MOA, USAID, BCIC, and other national and international agencies.

The Development of Infrastructure

FDI-II activities for infrastructural improvements mainly includes identification of required infrastructural improvements for better access to factories, better loading facilities for barges and rail wagons, bulk delivery systems, improved handling at ports for imported fertilizers, and low cost storage by private distributors.

The Project Facilities

The FDI-II facilities included a project office in Dhaka and divisional offices in Bogra, Chittagong, and Khulna. This arrangement provided excellent linkages with the ports, fertilizer factories, major fertilizer markets, and all agricultural areas. The project office at Dhaka included a conference room, library, and office space for about 120 staff. To provide transportation, a total of 32 staff vehicles, one bus, and 45 motor cycles were used. Excellent transportation played a key role in assuring project monitoring, problem identification, smooth transfer of technology, and efficiency in data collection from 61 districts in the country.

The Technical Assistance Staff

The successful implementation of FDI-II involved a strong TA staff comprised of 10,841 person months for HCN staff, 254 person months for long term expatriate staff, and 75 person months for short term consultants. Both long-term and short-term consultants were used to respond to project needs and requests for technical assistance or special studies from BDG and USAID.

The four components of policy reform, credit, dealer development and technology transfer, and the MIS were implemented under the supervision of expatriate consultants supported by a number of HCN specialists and other staff. The expatriate and local staff worked together to achieve the objectives of the project of increased fertilizer use and establishment of a commercially viable private sector fertilizer marketing system.

Support from IFDC Headquarters

The guidance and support from IFDC Headquarters in Muscle Shoals, Alabama, USA facilitated greatly the implementation of FDI-II. In addition to overall guidance and supervision of FDI-II, the contributions of IFDC Headquarters involved (1) organizing, managing, and coordinating external training programs, (2) providing short term consultants for special studies and installation of a local area computer network, (3) assisting in the procurement and shipment of project commodities, (4) providing support for project accounting and administrative matters, and (5) library support services. The enthusiasm and contributions of IFDC Headquarters throughout the LOP were essential for the success of FDI-II.

Project Administration and Accounts

An amount of U.S.$ 17.9 million was spent by FDI-II, which is about 97% of the total estimated budget. About 98% of the projected total person months was used during the 7.5 years of FDI-II. The FDI-II administration and accounts units performed all administrative and accounts activities in compliance with USAID guidelines and IFDC requirements and developed a system to record all purchases of project commodities. Inventory records were provided to the MOA, who is to receive all the commodities at the end of project.

Project Impacts and Benefits

FDI-II made major and beneficial contributions to improved fertilizer use technologies, fertilizer distribution efficiency, expansion of credit by the private and nationalized banks, employment generation, and increased agricultural productivity. The principal benefits are (1) fertilizer is available to farmers in all locations of Bangladesh at reasonable prices, (2) the number of farmers using fertilizer increased, (3) improved fertilizer use efficiency resulted in increased yields and increased returns to farmers, (4) new employment opportunities were generated, (5) fertilizer imports were handled more efficiently and at substantially lower costs than under BADC, and (6) the BDG was able to reallocate funds from fertilizer subsidies to other areas of the economy. Of significant importance, the FDI-II helped Bangladesh to achieve the goal of self-sufficiency in rice. The project had the following important impacts:

Farmers

Fertilizer use increased considerably. An estimate of IFDC based on various studies shows that number of farmers using fertilizer increased from about 8 million in 1985-1986 to about 11 million in 1991-1992.

Fertilizer use is widespread among small and marginal farmers in Bangladesh. The findings of the farm-level fertilizer price survey conducted every month since 1988, indicated that the overwhelming majority of the farmers purchasing fertilizer from the retail markets are the small farmers. The farm-level fertilizer use survey (FLFUS) conducted through FDI-II during Boro 1990-1991 found that the small farmers tended to use more inputs such as fertilizer and HYV seeds than larger farmers. This supports the findings of other studies which show that the adoption of modern technology is greater among small farms compared to large farms.

Higher input use leads to higher yields. The 1990-1991 FLFUS found that yields from the fields of small to medium farmers were consistently higher than those of large farmers. Although the differences were not great in rice, they were exceptionally higher for potatoes, sugarcane, and vegetables. Potato yields were about 21% higher on the small and medium sized farms, and as much as 50% higher for vegetables. As small farmers often have very small plots as large as 2.5 acres, the intensity of cultivation is obviously high. As a whole, average paddy yields increased from 1.4 MT to 1.8 MT per hectare between 1986-1987 and 1992-1993, thus an increase of about 30%.

Increased yields resulted in increased farm income. With the increase in input cost and virtually no change in the HYV paddy prices, the net return to HYV paddy did not decrease, mainly because of the increased yield. The net return for HYV paddy ranged between Tk.7,135 and 8,473 per hectare between 1986-1987 and 1991-1992.

Dealers are providing fertilizer credit to enhance the ability of farmers to purchase fertilizer. The FDI-II monthly survey on fertilizer prices and other agricultural inputs found that private dealers provide fertilizer on credit to farmers at zero to negligible interest rates. Between 1987 and 1994 the percentage of farmers who reported that access to funds limited their purchases to fertilizers has declined from 23% to 1%.

Improvement of fertilizer distribution yielded savings and benefits for Bangladeshi farmers. From 1988 to present, fertilizer purchases in bagged form, which are less expensive than loose purchases, have steadily increased and resulted in real savings for Bangladesh farmers. This is one of the outstanding benefits of the improvement in fertilizer distribution that resulted from agricultural privatization initiatives by the BDG. In 1988, about 35% of urea, about 35% of TSP, and no MP was purchased in bagged form. By the end of the first quarter of 1994, these percentages increased to about 90%, 75%, and 60%, respectively. The farmers, who are undoubtedly the rural poor, saved about Tk.1,000 million or U.S.$ 25 million from increased purchases of fertilizer products in bagged form.

Food Grain Production

Food grain production increased considerably. With increased fertilizer sales, total food grain production increased from 16.5 million MT in 1986-1987 to about 19.5 million MT in 1992-1993. Total rice production increased by an annual compound rate of about 3% compared to the projected goal of a 4% annual increase during this period. Fertilizer use is not the only factor for not achieving that project goal. Because other factors such as slow growth in irrigation, HYV area, and output prices constrained increases in rice production.

Incremental food grain production - food for additional people. An incremental food grain production of 3.0 million MT between 1986-1987 and 1992-1993 provided food for an additional 15 million people during that period.

Increased food production reduced the food gap. The increased food grain production reduced the national food gap by 69% between 1986-1987 and 1992-1993. The food gap declined from 1.3 million MT to about 0.4 million MT during that period.

Increased food grain production reduced rice imports. With increased food grain production, the import of rice and wheat declined considerably and no rice was imported during the last 3 years. This achievement had a direct and favorable consequences on the national budget and foreign exchange reserves.

Employment Generation

Prior to 1978, there were approximately 60,000 appointed retailers, but only 6,000 were active. After liberalization of policies in March, 1989, a large fertilizer distribution network was established in the private sector. According to recent FDI-II estimates, there are about 108,000 retailers who are active in the fertilizer trade, 13,000 wholesalers, 1,398 distributors, and 215 importers. These retailers, wholesalers, importers, and distributors employ about 60,000 persons. Thus, the total employment generated in fertilizer marketing, including the self-employed retail network, is estimated to be about 170,000 persons. An estimate of FDI-II shows that an additional about 60 million person days of farm employment was created in the fertilized HYV Boro area. The total incremental employment created could not be estimated but is surely substantial.

BDG Savings

BDG saved funds as a result of subsidy withdrawal and privatization of fertilizer importation and the domestic fertilizer business. Because fertilizer imports and domestic marketing are now managed by the private sector, the BDG no longer bears the expense of a state controlled system of fertilizer importation and marketing. Full cost pricing of

fertilizer and private fertilizer business activity had a favorable impact on the national budget and savings from 1988-1989 to 1993-1994 are estimated at Tk.4,758 million (U.S.$ 119 million).

Fertilizer Importers, Distributors, Dealers, and Retailers

The project resulted in the emergence of business entrepreneurs that are now actively involved as private sector fertilizer importers, distributors, and dealers. FDI-II provided support to establish the Bangladesh Fertilizer Association (BFA), which strengthened the organizational capacity of the fertilizer importers, distributors, and dealers. Overall, the FDI-II project benefitted fertilizer dealers in the following areas: (1) improved business acumen, (2) improved access to credit, and (3) improved ability to provide customer services to farmers and facilitate technology transfer.

Banking Sector

The lending institutions benefitted from the training programs and their capacity to appraise loan applications, reduce transaction costs, and improve recovery rates improved. As a result, of the CCP of FDI-II, the commercial banks extended loans to fertilizer importers, distributors, and dealers. During FDI-II, the total amount of loans made to the private fertilizer sector totaled Tk.15,570 million (U.S.$ 389 million).

Women

Although there were no direct consequences for women by FDI-II, increased fertilizer use resulted in increased food grain production and provided work for women in post harvest activities. This certainly increased their income and improved their livelihood. FDI-II emphasized recruiting women staff as specialists and support staff. This provided an opportunity for those women to develop their careers, increase their skills, and improve their incomes. At the end of FDI-II, 20 women were employed by the project and represented 10% of the total staff.

Indirect Benefits

The FDI-II project, which aimed to create a competitive atmosphere in fertilizer marketing, had significant secondary benefits which cannot be quantified. The value added in transportation, storage, trade, and industry which come partially from increased fertilizer production and food production can not be quantified, but is surely substantial. The project indirectly provided economic benefits to the consumers of agricultural products because

increased fertilizer use increased yields and therefore, reduced production costs per unit of output, and thus lower food prices that benefitted poorer consumers.

BADC

The FDI-II project, by improving the use of fertilizer, contributed to alleviating poverty in the rural areas of Bangladesh. However, the adverse effect of the project on the gradual demise of BADC cannot be disregarded. About 6,000 employees of fertilizer wing of BADC were displaced due to replacement of their activities by private sector. Although many found employment elsewhere, the fate of a large number of employees remains uncertain. The BDG still has an unnecessary fertilizer related budgetary burden. It incurs a cost of about Tk.200 million (U.S.$ 5 million) annually for overhead, salaries, and allowances of employees in the idle fertilizer wing of BADC.

Lessons Learned

The FDI-II project is recognized as a model of the transition from a government controlled and operated fertilizer marketing system to a market-oriented fertilizer sector. There are many factors which contributed to the success achieved through FDI-II including a sound project design, a capable and dedicated project staff, and adequate availability of the resources needed for project implementation. However, an often overlooked factor and one which was absolutely essential to FDI-II project success, was the productive working relationship that existed between USAID, the Ministry of Agriculture, and the FDI-II staff. This unique relationship, driven by a common will to achieve increased efficiency in fertilizer marketing and improved fertilizer use, was the key to project success. The experience of FDI-II offers instructive lessons and suggestions that provide a solid basis for the development of agribusiness in the country. The important lessons are:

- Competitive market forces play a major role in stimulating agricultural sector efficiencies.
- Technical assistance in concert with the government is essential to project success.
- A community of entrepreneurs must be fostered through technical assistance, training, and credit.
- The benefits of proposed policy reforms must be explained continuously to the public and private sectors.

- Commercial credit is essential for agribusiness to replace production, distribution and marketing functions of the public sector, particularly in new, high risk areas.

- Consideration should be given to government employees displaced by a transition to a market economy.

- The timely and systematic flow of information is essential for decision makers in public and private sectors.

- Technology transfer is essential for privatization.

Mid-Term evaluation of FDI-II confirms the lessons learned:

- AID agricultural development projects with major policy reform objectives should be implemented over 5-10 years if institutional change is to be successful.

- Agricultural policy reform must be viewed as an evolutionary process.

- Significant agricultural policy reform is possible, given sufficient resources and commitment by USAID and the host government.

Shortcomings

No final report is complete without reference to goals that were not realized or those for which only partial progress was realized. There are at least three areas that warrant discussion in this regard.

- The assets of BADC, specifically, the warehouses were not transferred to the private sector or other government agencies as intended. Only a capacity of 95,700 MT was divested and at the close of FDI-II, BADC retained a total warehouse capacity of about 373,900 MT. The warehouses are virtually empty but the BDG continues to incur costs.

- Another shortcoming also involves about 6,000 redundant employees of BADC at the close of FDI-II and represented truly a displaced public sector entity. Perhaps with other policies and actions a new role for BADC could

have been created. Such a role may have included work in the private fertilizer sector that involved regulation, quality control, enforcement of legal weights and measures, environmental monitoring, monitoring fertilizer prices and availability and related work. Thus, BADC was not reorganized as some imagined possible and desirable.

- The third shortcoming relates to the sequence of policy reforms. As FDI-II closed, it became apparent that it would have been useful to the privatization effort to have formulated and implemented a policy on fertilizer regulations at an earlier date. This is also the case with the Bangladesh Fertilizer Association.

Issues

Increased fertilizer use benefitted the country at large. A number of important policy reforms were taken to promote the development of the private fertilizer sector. But the fertilizer sector now faces issues that need attention for sustainable long-term development. The key issues are:

Maximum Retail Prices of Fertilizers: Fertilizer retail prices are a major issue of policy concern. Fertilizer prices in a market economy behave according to market norms. But short lived price hikes create confusion among the policy makers and government may be sidetracked by vested interests. This may led to the fixing of maximum retail prices by government which is contrary to the principles of a free market economy.

Fertilizer Buffer Stocks: Some interest has been shown by BDG to maintain an intervention stock of fertilizers to "protect" farmers in remote areas from high prices and to assure access to fertilizers. Such concerns are not only inconsistent with the BDG policy reform but would (1) cause additional budgetary problems, (2) displace private distribution in remote areas, and (3) create major disruptions in the market.

Use of Donor Funds for Importing Fertilizer: In a free market economy, private sector importers always choose to import fertilizers from sources with competitive prices that allow a profit to be earned. But imports through donor funds do not allow that opportunity and donor procedures are cumbersome. Although, importers prefer to use cash foreign exchange, their lack of interest in using grant funds for fertilizer imports may be a concern to the government of Bangladesh.

The Fertilizer Control Order: Enactment of fertilizer control order is essential to (1) promote integrity and discipline in market place, (2) provide assurances that fertilizers are identified properly, (3) provide assurances of the validity of the quality and quantity represented by sellers, and (4) protect the interests of the farmers and traders.

The Bangladesh Fertilizer Association: The BFA needs continuous technical assistance to mature, develop, and prosper.

Market Intelligence: Market intelligence is a key factor in understanding the dynamics of a market economy. Therefore, the MIS of FDI-II needs to be institutionalized within the public and the private sectors, otherwise a serious void will be created with the close of FDI-II and reliable market information will be lacking.

A Final Note

Policies and programs already in place have brought rapid growth in agriculture. But in the fertilizer sector certain issues are yet to be resolved. For example, donor financing of imports, BCIC pricing and marketing policies, establishment of a national fertilizer regulatory system, and establishment of an MIS in the public and private sector are all key issues which need to be resolved. Current policies provide for further increases in the irrigated area and fertilizer use according to trends which have developed over the last several years. However, even faster growth in incomes and employment may be possible as the country turns toward higher value crops and creates an environment for a variety of agricultural production and service activities. The sustainability entails transformation of subsistence farming to commercial farming.

USAID will continue to support the efforts of BDG in changing agriculture from food grain production to other high value crops which is expected to accelerate growth in agricultural incomes, increase returns and demand for labor, and attract investment in agri-processing. The forthcoming Agribusiness Technology Development Project shall attempt to remove the barriers to increasing agricultural production, crop diversification, and economic growth in general. The government of Bangladesh, through FDI-II, demonstrated to donors and the international business community that the country realizes the benefits of a competitive market and is willing to make difficult policy decisions and implement reforms that contribute to the economic and social well-being of its citizens.