

**Agrobased Industries and Technology Development Project
(ATDP)**

Project Completion Report

Submitted to
The United States Agency for International Development
Contract No. 388-C-00-92-00039-00

by
International Fertilizer Development Center

August 31, 2000

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Acronyms

ADB	Asian Development Bank
ACF	Agribusiness Credit Fund
ACFDF	Agribusiness Credit Fund Development Fund
ADOB	Agribusiness Development Organizations of Bangladesh
AVRDC	Asian Vegetable Research and Development Center
ATDP	Agrobased Industries and Technology Development Project
BADC	Bangladesh Agricultural Development Corporation
BAPA	Bangladesh Agroprocessors Association
BARI	Bangladesh Agricultural Research Institute
BFA	Bangladesh Fertilizer Association
BFFEA	Bangladesh Frozen Foods Exporters Association
BRAC	Bangladesh Rural Advancement Committee
DAE	Department of Agriculture Extension
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross Domestic Product
GOB	Government of Bangladesh
HACCP	Hazard Analysis and Critical Control Point
HKI	Helen Keller International
HYV	High Yielding Variety seeds
IFAD	International Fund for Agricultural Development
IFDC	International Fertilizer Development Center
MDB	Multilateral Development Bank
MIS	Management Information System
MOA	Ministry of Agriculture
MOFL	Ministry of Fisheries and Livestock
NELCO	National Electronics Company
NGO	Non-Government Organization
PABA	Program of Assistance to Borrowers from the ACF
PAGE	Poverty Alleviation, Gender Equity and Environment Development
PRAN	Program for Rural Advancement Nationally (brand name for the Agricultural Marketing Company Ltd.)
STAMP	Support for Technology Acquisition and Mastery Program
STC	Short Term Consultant
TPS	True Potato Seed
UK	United Kingdom
UMB	Urea Molasses Block
URAA	Uruguay Round on Agricultural Agreements
USAID	United States Agency for International Development
USG	Urea Super Granule fertilizer
WTO	World Trade Organization

Acknowledgments

The International Fertilizer Development Center (IFDC) acknowledges the support and partnership of the U.S. Agency for International Development (USAID) and the Ministry of Agriculture (MOA) in the joint effort to develop private sector agribusiness in Bangladesh.

We appreciate the contributions of those at the USAID Mission and the Government of Bangladesh who provided guidance in the design and implementation of the ATDP. We are especially grateful to Secretary of Agriculture A.M.M. Shawkat Ali for his personal involvement in the project, including the creation of the Agribusiness Credit Fund and Development Fund. Such cooperation helped support and inspire the project team, led by Ron Black and Ishrat Jahan.

Dan Waterman, IFDC Development Officer, drafted this project completion report and Ishrat Jahan, Deputy to the Chief of Party, prepared the appendices. Ron Black, Chief of Party, as well as Ms. Jahan and other senior ATPD staff, contributed significantly to the report. The opinions expressed herein are those of IFDC and do not necessarily reflect the views of USAID, the Ministry of Agriculture, and other project partners.

Executive Summary

The Agro-based Industries and Technology Development Project (ATDP) played a leading role in transforming attitudes toward agribusiness in Bangladesh. The project demonstrated the opportunities for commercial agriculture and encouraged a first generation of agro-entrepreneurs to explore new paths and opportunities. Results have exceeded expectations. Under the auspices of the Ministry of Agriculture, with funding by USAID and implemented by IFDC, the ATDP is widely regarded in Bangladesh as a beacon for agribusiness development.

Begun in January 1995, the project aimed to increase productive employment in agriculture and related enterprises through the creation of competitive markets for agro-related inputs, outputs and technologies. Objectives included policy reform, free flow of capital and technology, diversification and intensification of crop production, and poverty alleviation. The project aimed to encourage market-driven technology development and transfer, and to provide agro-entrepreneurs with information and access to credit.

USAID provided nearly \$10 million to implement the project. In order to achieve the ambitious targets, project leadership devised a \$4.5 million development fund from interest generated by a revolving Agribusiness Credit Fund (ACF). The Government of Bangladesh allocated \$26 million for the ACF, which was channeled through commercial banks and monitored by the project. The credit provided vital liquidity and spurred banks to lend to nascent agro-enterprises. The development fund enabled the project to establish a matching grant program and to double the number of regional offices to eight.

The achievements of the project flow from a strategy that delivered a holistic, integrated package of services to agribusiness and capitalized on partners to multiply impact. For example, ATDP exceeded or met five of its six primary contractual targets:

- Against a target of 100,000 over the five years, 700,000 farmers adopted more productive, environmentally sound technology (mainly through the use of urea supergranule fertilizer).
- Compared to a target of 80, contract grower arrangements numbered 172.
- Investments/loans made in agribusiness totaled 12,700, nearly double the target of 7,000.

- Representing 2.5 times the goal, \$257 million in credit and investment was realized.
- Versus a target of 130,000, new jobs in agribusiness were created for 70,000 people.
- Over 50 significant policy reforms were enacted, fulfilling the weighted matrix indicator.

Critical to the project's impact nationally were its synergistic alliances with local organizations and leveraging of staff and training resources. In the process, it helped build the capacity of these local institutions and disseminate improved technologies more broadly. From the beginning, ATDP partnered with the Department of Agricultural Extension and government research services to commercialize breakthrough technologies such as urea supergranules (USG). This fertilizer technology enables poor rice farmers to increase their incomes by more than 50%. Through collaboration with nongovernmental organizations (NGOs), notably the Bangladesh Rural Advancement Committee (BRAC), the project extended its reach indirectly to tens of thousands of small-holder farmers. The solid success of pilot activities such as the model poultry villages has stimulated their replication by the influential Grameen Bank.

The Planning Ministry evaluated the project in early 2000 and concluded that the project had reached its targets on time and "has accomplished its overall objectives." The final evaluation team highlighted specific achievements, including:

- The improved packaging and pre-cooling techniques introduced by ATDP helped increase vegetable exports by \$5.6 million during 1997-99.
- One business mission sponsored by ATDP for shrimp processors to the US in 1999 generated \$18 million in spot orders and \$35 million in follow-up purchases
- ATDP conceptualized "model poultry villages" as a vertically integrated industry and established them in 12 pilot areas. The Government of Bangladesh (GOB), NGOs and World Bank praise the idea.
- Introduction of USG has contributed \$23 million to Gross Domestic Product in 1998/99 and \$86 million in 1999/00 and has created employment for 13,350 people.
- ATDP established a federation of agribusiness trade associations.
- Thanks to ATDP support to borrowers, the loan recovery rate from credit generated through the ACF-led commercial process is 95%.

Private sector enthusiasm for ATDP and its "brand name recognition" convinced the Ministry of Agriculture and USAID to fund a follow-on project to capitalize on the growing proof and recognition that agribusiness has potential for growth and wealth. Other donors are also adopting lessons from ATDP. For example, in designing an agricultural project for the northwest region, the Asian Development Bank (ADB) is borrowing heavily from the strategies, practices and activities of ATDP.

The ADB project preparation mission undertook a detailed analysis of ATDP and concluded: "The project has been a catalyst in building confidence in the business and financial community that agribusiness is a good investment opportunity. The policy dialog has contributed to a better business environment."

Obviously, any individual project will have only limited impact on the enormous and complex problems facing agricultural and agribusiness development in a country with such a large rural and poverty-afflicted population as Bangladesh. ATDP tried to balance and optimize results among the competing demands with its limited budget and staff. The national presence and scope of the project served as strengths in terms of effecting awareness and policy reform. The trade-off was thinly stretched resources.

An interim evaluation conducted by USAID led to re-orientation of the project so that during the last 18 months it focused on fewer sectors and agro-enterprises, such as shrimp, to consolidate impact. The evaluation report recommended the addition of an agribusiness advisor and argued for some different emphases in implementation, e.g., devoting more effort to analytical studies on policy issues and marketing.

ATDP attempted to incorporate policy reform, agribusiness promotion, business and technical assistance and training, capacity building, and information dissemination in all project activities. For example:

- Using sound arguments and effective advocacy campaigns, including by trade associations, the project significantly influenced policy reform. The GOB budget for 2000/01 adopted 37 tax reductions, averaging 75%, on agricultural-related inputs, as recommended by the project. IFDC prepared a major analysis that helped prepare the GOB for implications of the Uruguay Round Agreement and World Trade Organization obligations on agriculture.

- The monthly *ATDP Agribusiness Bulletin* quickly became the pre-eminent agribusiness publication and source of practical technology and information.
- The project conducted 105 overseas study and business missions for 325 people.
- Clients imported \$100 million in U.S. goods, mainly fertilizer and poultry equipment.

The dimensions and focal activities evolved throughout the duration of the project, in accord with its demand-driven philosophy and with real opportunities to stimulate new value-added production, technologies and enterprises. Short-term consultants worked directly with clients. As a result for example, ATDP was directly responsible for:

- Demonstrating how to modernize the potato industry, beginning with better seed through production to storage to successful export to processing French fries.
- Supporting the dynamic growth and diversification of the largest agro-processor.
- Increasing exports of fruit and vegetables for assisted client enterprises—from \$120,000 in 1998 to \$290,000 in 1999 and \$166,000 in the first quarter alone of 2000.
- Working through an NGO named Poverty Alleviation, Gender Equity and Environment (PAGE), in Comilla to help 300 poor farmers, mainly women, begin exporting vegetables to the United Kingdom, and thus raising their incomes by 30%.

Lessons learned through ATDP will provide valuable guidance for the successor project and for interventions by others. These include:

- An integrated, reinforcing package of assistance to entrepreneurs over sufficient time is critical to fostering agribusiness growth in Bangladesh. Programs must be demand-driven, customer-oriented, hands-on, flexible, and aimed at sustainability.
- There should be focus on commodity chains and on constraints throughout the vertical production, processing and marketing systems.
- The private sector and their trade associations are effective channels to transmit technology and to improve policy, regulatory, food safety and marketing regimes.
- Policy reform involves an approach that includes solid analysis and continuous dialogue.
- Banks, NGOs and government agencies can help leverage resources and outreach.
- Progressive enterprises are critical to building linkages and institutional capacity.
- Tangible results produced early will stimulate demonstration and multiplier effects.

- Tailored business and technical support are generally required along with access to credit in order to develop solid and sustainable agro-enterprises.

(Section IV. 3 recommends specific areas for industry and operational focus in the next phase.)

All agree that ATDP stands out among the many, and usually larger, agricultural projects in Bangladesh, because it went beyond just fulfilling its objectives. It had a positive impact that resonated throughout the private, NGO and public sectors. The president of the Agribusiness Development Organization of Bangladesh (ADOB) who was a former Deputy Minister of Finance - Fakhru Islam Munshi - said that ATDP caused a revolutionary shift in attitude about agriculture. He was quoted in the press in December 1999 as saying:

“In the past agriculture was for subsistence. Now it is an industry. This change has been brought about by ATDP.”

ATDP Project Completion Report

Introduction

The goal of the Agrobased Industries and Technology Development Project (ATDP) was to increase productive employment in agriculture and related enterprises through creation of competitive markets for agricultural and agribusiness inputs, outputs and technologies.

The project objectives contained in the contract with USAID were to:

- Promote reforms in policies related to trade, industry and agriculture, budget and commerce, foreign investment, and legal and regulatory regimes in order to help enable the free flow of capital and technology, the creation of employment opportunities, and the diversification and intensification of crop production.
- Encourage private sector, market-driven technology development and transfer; and provide agro-entrepreneurs with information and access to credit to foster private agribusiness in Bangladesh.

ATDP was a five-year project later extended by six months (January 1995-July 2000) of the Ministry of Agriculture with support from USAID and was implemented through a contract between the International Fertilizer Development Center (IFDC) and USAID. Ronco Consulting Corporation and Winrock International were engaged as sub-contractors.

ATDP established eight field offices, in Kapasia, Rangpur, Jessore, Chittagong, Sherpur, Sylhet, Rajshahi and Barisal. It focused on eight sectors and created operational units as follows.

Sector/Product	Operational Units/Offices
1. Fruits and Vegetables	1. Agribusiness Development Unit
2. Shrimp	2. Regional Offices
3. Poultry	3. Policy Unit
4. Dairy	4. Credit and Investment Unit
5. Feed Grains	5. Management Information System (MIS) Unit
6. Seed	6. Administration and Training Unit
7. Fertilizer	
8. Agri-machinery and equipment	

USAID contributed \$9.75 million in grant funds. The GOB provided \$26 million for creation of an Agribusiness Credit Fund (ACF), and \$4.5 million during the project to finance matching grant programs and regional operations under ATDP. This Development Fund was supported from interest produced by revolving loans under the ACF.

The Bangladesh Bank administered the ACF. Loans were made at the normal inter-bank loan rate to nine participating lending institutions, which disbursed the funds using their established procedures. The participating banks matched the funds at a two-to-one ratio, thus greatly expanding credit available to agribusiness.

In order to accomplish the objectives, the project leadership adopted a strategy to:

- Strengthen the technical and financial capacity of small, medium and large sized agribusinesses in order to increase production, processing and marketing.
- Forge backward, forward and lateral links among agribusiness entrepreneurs and their potential partners in the public and private sectors to ensure the development of a supporting infrastructure for agribusiness development.
- Assist to remove constraints hindering the growth of agribusiness in Bangladesh.

The project activities provided:

- Technical assistance, training and field demonstrations for agribusiness entrepreneurs, bankers, government officials and farmers in areas such as crop production with improved technology, marketing, post-harvest processing, seed technology, poultry development, credit and risk management.
- Market information and help in establishing linkages between processors, exporters, contract growers, and national and international traders.
- Policy analysis to the government and donors aimed at increasing agribusiness investment.
- Guidelines for financial institutions participating in the ACF.

History

ATDP was a design and perform contract with USAID that extended from 1992 to 2000. ATDP implementation began in early 1995, after a year's gap from the previous IFDC project - Fertilizer Distribution Improvement-II, which successfully transferred the formerly public sector fertilizer supply and marketing system to private sector importers and dealers. An original task from the GOB for ATDP was to improve the monitoring of fertilizer markets. The project therefore quickly undertook a monitoring and information service that provided critical market reports to dealers, farmers and government. The project managed and trained GOB staff in the collection and analysis of fertilizer market data, and then successfully turned over responsibility for this function to the Ministry of Agriculture in 1999 as planned.

Also at the request of the GOB, the project focused on post-harvest technologies, poultry and livestock production, and the use of modern agri-inputs, particularly seed, fertilizer and agri-machinery. The goal was to increase the production of high quality crops that would be available for processing and export. Bangladesh had nearly become self-sufficient in rice. The GOB and USAID wanted to stimulate the emergence of private sector agribusiness so that the nation's millions of small-holder subsistence farmers could enter the commercial economy and improve their incomes in the process.

The experience of 15 years in the agricultural sector in Bangladesh provided IFDC a grasp of how best to overcome the many obstacles, devise strategies, and identify the progressive farmers and agri-input dealers to stimulate a sustainable and broad evolution to agribusiness. The project was designed to be flexible, innovative, demand-driven, and results-oriented. From the first months, project staff crafted training and policy initiatives in response to needs of key entrepreneurs and farmers and to the opportunities available in proven but largely unused technology improvements. The companion ACF was a valuable tool in leveraging bank lending for vital working capital to put underutilized capacity into production and to attract attention.

The performance criteria evolved during the life of the project. For the first two years the project was evaluated on the basis of "deliverables" in the form of policy studies, technical reports, training and field demonstrations in support of accomplishing the fertilizer access and

technology transfer programs. Objectively verifiable measurements of results were later added. In addition to frequent consultations with the MOA and USAID project managers, steering committees monitored progress and provided direction on the technical assistance activities, ACF, and the use of the Development Fund.

USAID conducted an interim evaluation in the second half of 1998 that led to re-orienting the project to fewer sectors and to the addition of an agribusiness advisor for the final year.

"ATDP has tried to focus on too many sectors and geographical areas with a limited amount of resources. ATDP has overly focused on technological aspects of agribusiness promotion. It has not given enough attention to assessing the market potential of goods and services."

- USAID Interim Evaluation, January 1999

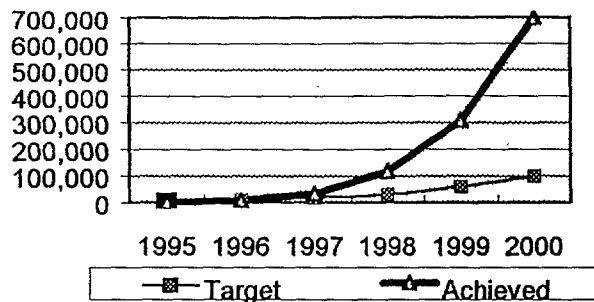
I. Performance

1. Indicators

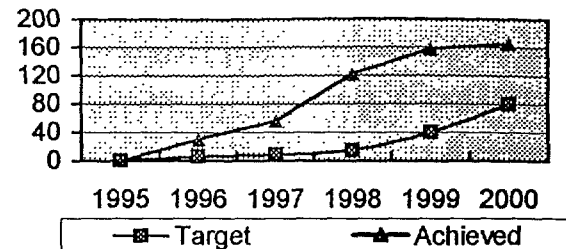
Four sets of results measurement packages were used to guide and monitor progress of the project on a quarterly basis. The project met all the requirements of the MOA for the original series of "deliverables." They covered five categories—Technology (pilot zones, field days, training workshops); Policy (studies and conferences); Credit (preparation of investment proposals, credit monitoring reports); Market Information Systems (monitoring reports, consultant reports, MIS training); and Administration (budget status reports).

USAID and IFDC jointly developed verifiable measures related to six critical objectives and set ambitious annual targets to evaluate the breadth and impact of the various aspects of technical assistance provided under ATDP. The graphs below indicate the actual results against the final definitions and targets that became the contractual measurements.

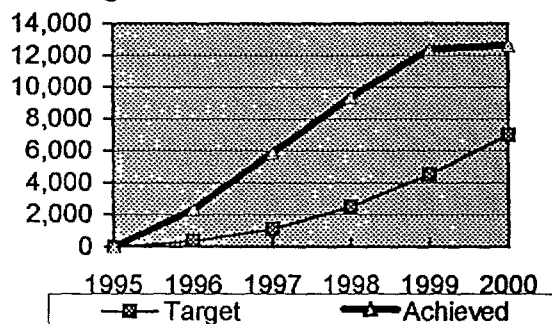
Farmers using more productive, environmentally sound technologies



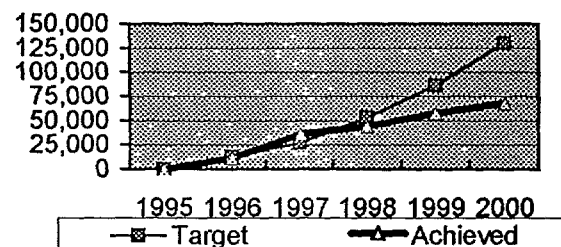
Contract grower arrangements



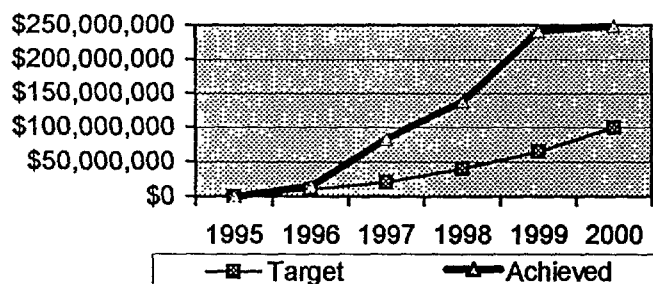
Agribusiness investments/loans



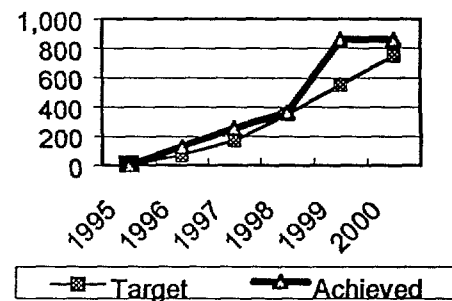
New agribusiness employees



Increase in agricultural productivity through agribusiness investments/loans (US\$)



Policy reform



NOTES

- ATDP also established 8 pilot zones in the locations of the project field offices.
- The figures used in the chart depicting new agribusiness employees represents direct job creation. ATDP estimates that employment for another 71,500 people was indirectly generated through support to NGOs such as BRAC and PAGE. The combined total of 141,500 would exceed the target of 130,000. The combined figure is used for the GOB results indicators below.

The Government of Bangladesh also negotiated a "Results Package" for the project. The nine categories with targets and actual performance are contained in the chart below.

Objectives	Targets	Results	%
Fertilizer blending plants developed	N/A	13	N/A
Commercial poultry and dairy farms assisted	1000	2108	210%
Modern agro-processing firms supported	1000	495	50%
Joint ventures facilitated	N/A	3	N/A
Farms with improved technology	100,000	702, 420	700%
Contract grower arrangements	20	172	860%
Rural employment (jobs on/off farm) created	500,000	141,500	28%
Soil testing kits in use	1000	187	19%
Exports of non-traditional products increased	N/A	6 new products	N/A

USAID added a fourth set of results indicators, in connection with the revised work plan that governed the final (extended) year of the project (April 1999-July 2000). The targets were directly linked to each activity category in the plan and divided by sector. In general, they measured: number of exporters assisted, quantity of exports, new commercial agribusiness operations, number and volume of agro-processing units, number of export zones developed, linkages established between exporters and new markets, improved capacity utilization. In every case the project achieved these targets.

Attempting to measure the incremental contribution and impact of a project such as this is difficult. The project played a catalytic role, and its multiplier effects indirectly stimulated many outcomes that would not otherwise have happened. The results indicators themselves, some proxy measurements, and monitoring assumptions are subject to interpretation and thus could be perceived to be overstating project impacts. However, the monitoring and evaluation effort represents an honest, well-documented and defined attempt to capture performance and results attributable to the project. Such measures should be further refined and clarified in the early stages of the successor project.

In any event, it seems clear that the project overall exceeded its objectives and produced results and impact far greater than anticipated.

2. Contribution to GOB and USAID Objectives

A primary goal of Bangladesh as expressed in official GOB documents and public platforms is to "develop the agricultural production system into a more dynamic and commercially profitable sector." The strategy aims at modernizing, diversifying, adding value, and improving marketing of agricultural production. The National Agricultural Policy paper of April 1999 describes the constraints, opportunities, priorities and directions.

ATDP has over the years directly addressed many key constraints and identified real opportunities. Through its practical analysis and well-grounded pilot demonstrations, the ATDP has helped influence the approach and attitude of the GOB toward agribusiness. The close intertwining of ATDP results and the national policy are exemplified in the following national objectives:

- Ensure modern agri-inputs to farmers at competitive prices; stimulate their use
- Increase the availability of credit for agribusiness
- Create opportunities for establishing agro-based and agro-processing industries
- Strengthen regulatory regimes, ensure truth in labeling of inputs and food safety
- Diversify crops
- Attract private investment for agri-machinery, processing and marketing
- Promote more balanced use of fertilizer
- Develop backward and forward linkages and the marketing system
- Introduce modern technologies

The ATDP also directly supported USAID strategic objectives of broad-based economic growth and agricultural development, in particular the transformation of agricultural systems—the graduation from subsistence agriculture to producing for off-farm markets, which contributes to employment and a more prosperous rural environment.

ATDP contributed to the accomplishment of the Strategic Objective of the USAID Mission in Bangladesh to support the growth of agribusiness. ATDP improved the ability of private enterprises to develop, produce, market and finance products and services in competitive

markets. Not only did the project provide direct assistance to enterprises, but it also strengthened support institutions and improved relevant policies, laws and regulations.

The successful performance and detailed monitoring records of ATDP transposed directly into the numerical indicators of results used by the USAID Mission in Dhaka to review its progress. They include: sales, export and jobs growth; policies improved; stronger market orientation, such as new markets and products; improved quality and lower cost of products by assisted enterprises; and increased access to capital.

“ATDP has become a brand name for agribusiness, which is a major reason why we are retaining the acronym for the successor project.”

- USAID Bangladesh official, June 2000

II. Cross-Cutting Aspects of ATDP

1. Policy Improvement

To achieve the policy reform objectives aimed at improving the climate for agribusiness, IFDC and USAID adopted the three-pronged approach that had proved so successful in liberalizing fertilizer markets in Bangladesh, and subsequently in establishing a private sector agri-input distribution system in Albania. The key elements of the strategy are:

- Provide a plan that includes analyses and a blueprint of how the reformed policies will work in practice in addition to economic theory
- Conduct continual dialogue with government and donors and begin immediately to work with entrepreneurs to demonstrate results and the potential of private sector-led agribusiness
- Organize the enterprises into trade associations and help them advocate for change

ATDP staff met with a wide range of government and private sector officials as well as progressive farmers in 1995 to assess the major impediments to the development of modern agribusiness. Together they developed a policy matrix of priority issues for each of the eight sub-sectors. The matrix described each issue, its implications for expanding market-oriented growth,

actions needed, and the responsible government agencies. Weighting points were assigned to the policy targets, and progress was evaluated.

Project management understood that priorities would change and new issues emerge as the project encountered the on-the-ground realities. The idea was to maintain continual dialogue and work incrementally to remove obstacles based on case studies by demonstrating the benefits that could accrue to the country from reform. In 1997 the project undertook a major review of the matrix in public forum and adjusted the targets accordingly. A total of 58 policy issues were identified across the 8 agribusiness sectors. Examples of success to which the project contributed include:

- Agro-processing—reduction of import duties on cans, jars and other packaging materials
- Seed—passage of an amended seed law and signed agreements with GOB research institutes to make breeder seed available to the private sector for production
- Fertilizer—an opened market for USG and its free movement
- Horticulture—permission for a private cargo airline
- Agri-machinery and processing equipment—rationalized tariff rates
- Livestock—bank loans for fattening beef cattle year round, not just for the holidays
- Poultry—removed anomalies in import restrictions on pre-mixed feed
- Fisheries—regulations to prevent indiscriminate collection of shrimp fries and destruction of other aquatic species

Project leaders conducted regular policy discussion sessions in a variety of settings with government officials and agribusiness trade associations. During project year 1998/99, for example, ATDP initiated 60 such policy meetings. They were instrumental in convincing the revenue authorities to treat agribusiness as a growth and value-added sector that should be unburdened by restrictive import tariffs. The Bangladesh Government National Budget plan for 1999/2000 reduced 25 tariffs, and the one for 2000/01 another 37 - all advocated by ATDP and the trade associations it helped form.

Project consultants produced a dozen policy studies and a score of position papers. They included recommendations on trade and tariff policies and the fertilizer situation. A major

analysis by IFDC in 1999 outlined the implications and recommendations for Bangladesh of the Uruguay Round on Agricultural Agreements (URAA).

Some argue that the project should have devoted more attention to preparing systematic economic analyses in order to influence the broader policy stage. Based on its long experience in Bangladesh and the existing plethora of analytical studies and recommendations by the World Bank and others, IFDC decided on a more targeted and concerted approach aimed at removing specific impediments to achieving targets. Most observers, including a team from the ABD and the Food and Agriculture Organization (FAO), accord the project high marks in influencing policy. Of course much remains to be done to improve the climate for business in Bangladesh.

"The core of what ATDP is really about is the removal of bottlenecks that you see between yourself and a successful business."

- USAID Mission Director in Dhaka, on August 17, 1999

2. Institutional Capacity Building

A key to its ability to influence policy change was the development of agribusiness trade associations. In particular ATDP helped organize the Bangladesh Agro-Processors Association (BAPA) and the apex Agribusiness Development Organization of Bangladesh (ADOB), a federation of 20 trade associations. The elected leaders of such associations are able to gain the attention of politicians, media and government officials. Still at an early stage of development, agribusiness trade associations represent more than a force for policy reform. As private sector institutions they can serve as conduits for information, training, quality control, and extension services to their members, other linked businesses, and farmers.

The most important institutional legacy of the project will be the enterprises themselves that ATDP helped establish and strengthen. As a result of client demand, project staff gave special attention to 2,200 enterprises. Of these, 1,288 were new entrepreneurs, 427 in the high potential field of poultry. Staff helped improve and restructure another 912 existing firms. Of those, 684 were engaged in the poultry sector, which has become a vertically integrated industry with ATDP support. Some of the larger firms that received critical assistance have become

institutions in their own right—providing training, technical assistance and credit in addition to their marketed products.

In building the capacity of enterprises to succeed, the project also strengthened support institutions such as the banking sector. Training programs and study tours were organized for the staff of the nine financial institutions participating in the ACF program. The purpose was to help bankers understand the opportunities, credit requirements, and risks of agribusiness. By introducing them to project clients with solid business plans, the commercial banks gained more confidence and experience, as reflected by the growth of the ACF program and the better availability generally of credit for agribusiness.

The GOB describes ATDP as "a project of the Ministry of Agriculture, with support from USAID." From the early days the project staff worked closely with Ministry departments and research organizations that had human resources and technologies needed to achieve the ambitious results. For example, it worked with the Department of Agricultural Extension and the main agricultural research organization to commercialize good technologies that were not being adopted. The sudden popularity of long dormant USG and true potato seed technologies demonstrated to the organizations the effectiveness of engaging the private sector and market forces, along with NGOs such as BRAC, to reach the farmers.

A major accomplishment of the project was the smooth handing over to the Ministry in mid-1999 of the fertilizer monitoring and reporting unit that the project had developed and staffed. A solid training and transition plan helped ensure the sustainability and quality of this function and of the monthly publication on agri-input and market monitoring that are important to the government.

To leverage its resources and expand its technology transfer capacity, ATDP collaborated with major NGOs, notably BRAC, PAGE and Grameen. The collaboration with NGOs proved far-reaching and fruitful indeed. ATDP was able to provide sound technical grounding to NGO staff, who in turn could disburse the information along with loans to thousands of members. By

combining technical assistance with micro-credit for agriculture, the organizations improved their service capacity and financial soundness.

Using \$2.38 million in loans under ACF, for example, BRAC was able to extend credit to 70,000 micro-entrepreneurs, mainly women, for poultry, livestock and other income-generating activities. Local and expatriate consultants from ATDP trained the BRAC trainers who relayed the information to their member micro-entrepreneurs. As part of technology transfer, ATDP staff regularly helped form associations of farmers specializing in a particular sector and located in the same village or area. This effort produced the successful poultry village model and established institutions that serve as channels for introducing new ideas and for marketing output.

3. Enterprise Development

“This is probably the best donor-funded project I have come across. The people working there at ATDP are thoroughly professional and business-minded.”

- Syed Kaiser Kabir, CEO of Renata Agro Enterprise Ltd.

To encourage all interested agro-entrepreneurs to establish, develop and expand their enterprises, ATDP provided technical assistance, training, and business and management information. Special attention was given to women entrepreneurs. The project also offered the following matching grant programs tailored to individual needs:

- Enterprises that required special help to meet their ACF loan objectives could use the grants to engage consultants, undergo business-related technical training, and seek suppliers of inputs and markets for their products.
- Entrepreneurs could apply for grants to study the latest agro-based technologies and marketing techniques and to explore international market opportunities.
- Firms wishing to make new agro-related investments could draw on a program to help them assess the most efficient and economical equipment and technologies.

At the beginning of the project, private sector agribusiness in Bangladesh was in its infancy and faced a barrage of obstacles, many of which still remain. ATDP support for the agribusiness pioneers contributed to demonstrating the potential of the sector and the rewards of

adding value and service. This helped encourage the government to recognize agribusiness as a priority sector that should be awarded similar treatment with other favored industries in terms of removing policy and tariff constraints.

ATDP helped promising enterprises of all sizes with equal dedication, whether it was sophisticated advice to the large-scale PRAN organization on expansion of food-processing and modern packaging or support to a micro-entrepreneur starting out with 100 laying hens and her first loan. The project leadership persisted in solving problems and personally intervened with tax and other authorities when warranted. When they could not help an entrepreneur, staff directed him to other private, NGO, donor or government programs that could.

Service, synergy, success and sustainability became the watchwords that popularized the project. Business people in Bangladesh like to diversify their risks and tend to prefer two or three smaller operations to one larger one. Because of its scope and flexibility, ATDP was able to provide business and technical help in commercial farm systems and show how to integrate the different endeavors, be they feed grains and seed, rice and shrimp rotation, or poultry and fish farming. Project staff and consultants prepared pre-feasibility studies for market segments and for individual clients for such ventures as frozen French fries, dairies, agri-machinery production, processing and packaging of fruit and vegetables.

As noted above, the project provided a significant contribution to the progress of new and existing entrepreneurs, notably in the production of poultry and USG. During the final 18 months, the project focused on 740 from the larger pool of 2200 enterprises and prepared profiles on them and the type of ATDP assistance provided. The monitoring and evaluation unit tracked their progress, using a baseline of sales and employment when ATDP entered the scene compared with the corresponding numbers in 1999.

The 740 client firms in all eight sectors realized improved performance, some very dramatically. For example:

- Total sales grew from 9,961 million taka at the beginning of ADTP support to 16,172 million taka in 1999. Employment grew by 66%.

- The 50 fruit and vegetable producers and processors increased their sales by 222% and employment by 95%.
- Not only did the 351 poultry producers boost sales revenue by 184%, they also increased job creation by 193%.
- Ten blended fertilizer operations grew by 209% and employed six times as many staff.
- Eleven feed grain operations saw a 12 fold increase in sales and 550% growth in jobs
- Starting a new industry, 205 USG distributors created an additional \$4 million in business and 752 more jobs

In part because of such success, the USAID evaluation team argued that ATDP should have narrowed its focus more rapidly after attaining national recognition of the potential for agribusiness. By shifting resources to fewer sectors, shifting emphasis from production to processing, and providing intensified help to select clients, some think the progress and economic impact of agribusiness would have been even greater. In any event, the quest to transform Bangladeshi agriculture into agribusiness has a long journey ahead.

4. Access to Credit

“The project has been a catalyst in building confidence in the business and financial community that agribusiness is a good investment opportunity.”

- ADB/FAO project preparation team report on ATDP in 1999

Probably the single most important constraint facing potential agro-entrepreneurs at the time the project was being conceived was the scarcity of credit and capital. For many it remains a severe obstacle today. Aware of the many natural risks and history of loan defaults involved in agricultural credit, the commercial financial institutions were unwilling to commit significant portions of their loan portfolios to agribusiness.

Budding enterprises that had invested all their savings to start and equip the business found themselves starved for working capital. It was estimated that considerable invested capacity in agribusiness was under-used. An injection of liquidity was the first priority to invigorate the sector.

The Agribusiness Credit Fund (ACF) played this crucial role by directly adding \$26 million, all reserved for agribusiness, into the banking sector and requiring the nine participating financial institutions to match two-fold from their own funds the ACF amount extended as credit. The Bangladesh Bank managed the program and each bank made its lending decisions according to usual business criteria.

The creation of the ACF was critical, but alone would have been insufficient to spur investment in agribusiness. The banks were willing to lend \$150 million under the program only because ATDP helped educate the bankers and reduce their risks through providing training and consulting support to their borrowers. Key to the success of ACF and its repayment rate of 95% was the creation by ATDP/IFDC and the Ministry of a Development Fund financed by interest earned on ACF loans.

This Fund, which contributed an additional \$4.5 million over the life of the project, allowed the creation of various grant programs. Administered by the project these facilities provided tailor-made technical, business and marketing training and hands-on help that increased the chances of agribusiness success and repayment of ACF loans to the banks. Private sector participants shared in the cost of the programs including business missions. Regular matching grants were awarded to 244 entrepreneurs. Another 263 agreements with NGOs provided micro-grants indirectly to 89,000 people.

The project helped introduce the concept of cost sharing in the country. ATDP participants in matching grant programs such as study tours and access to expert consultants, and advertisers in the project's *Agribusiness Bulletin* contributed over \$700,000 in direct cost contributions.

The project staff identified promising entrepreneurs and nurtured them through the process of applying for the first loan so they could put existing or new capacity to work. The matching grant and other activities supported by the Development Fund assisted hundreds of budding entrepreneurs directly and tens of thousands of progressive farmers through NGO programs.

A survey of ACF borrowers in 1999 revealed a wide range of loans—from \$200 to \$1 million. Over 50% of the survey respondents said they used the funds for investments in

livestock and dairy, 20% for poultry, and the remaining 30% about evenly divided into the other four project sectors.

5. Training and Study Tours

The project incorporated training into all activities. Emphasis was on practical information and techniques that would quickly translate into improved agri-business performance. Each sector team developed training strategies and "modules." After identifying prospective clients, sector coordinators and regional offices would organize workshops to encourage expansion of agribusiness and impart training in business management and technical topics.

The project engaged dozens of consultants, local and foreign, to provide advanced and specialized knowledge. These outside experts worked with clients directly, held workshops, and produced training manuals. The project was demand-driven and sought the experience of its clients to help address real problems and opportunities, not theoretical or unachievable ones.

During its life ATDP organized 444 in-country training programs that were attended by a total of 22,748 people. Over 5,800 entrepreneurs, 6,800 commercial farmers, 1,000 agri-input dealers, and 5,600 government personnel participated. They included 4,000 in the seed sector and 3,000 in the poultry industry in addition to 6,300 in USG techniques. The Development Fund was instrumental in enabling the project to expand the scope and nature of training and study tours in addition to the matching grant programs.

Training courses ranged from the general, for example, policy advocacy and business plans and loan application process to the specific, such as maintaining Hazard Analysis and Critical Control Point (HACCP) conditions for shrimp processing and safe spraying of fruit trees.

The Fund also contributed most of the funding for international training and study tours. ATDP organized 105 international programs in which a total of 325 Bangladeshis participated, of which over one-half were private agro-entrepreneurs. One-fourth of all participants came from the fruit and vegetable sector.

Study tours, especially those focused on a single sector, were very useful in exposing new and established enterprises to better ways of doing things. An effective and inexpensive tool was to arrange visits to other districts in Bangladesh where progressive poultry or shrimp producers could demonstrate their techniques for prospective sector entrants from elsewhere in the country. Tours to nearby countries such as India and Thailand provided inspiration as to what can be achieved along with new techniques.

While Bangladesh agribusiness is on a far smaller and simpler scale than the heavily mechanized farming and agro-processing systems in the United States, almost every agribusiness visitor who went there gained some useful insights and tangible benefits.

For example, Jalil Sarker, a local commercial poultry farmer, observed the efficient use of space in poultry farms in the US. Upon his return, he re-designed his cages, their spatial arrangement, and facility ventilation to gain a 267% increase in capacity, from a 20% increase in capital investment.

A similar leap in efficiency resulted from the trip of Dr. Monzar Hossein, a director of a commercial tissue culture laboratory in Bangladesh. As a result of better media preparation and hormone application techniques learned during his visit, Dr. Hossein tripled the production of his factory.

Officials from the Ministry of Agriculture and other GOB agencies who traveled with the groups of agro-entrepreneurs also gained valuable insights into the benefits of private enterprise, open markets and policies that support rather than impede agribusiness growth. The study tour groups met with counterparts at the local, state and federal level and with cooperatives and private service organizations to discuss how public-private partnership in the United States produces effective agricultural research, extension services business intelligence and marketing.

6. Market Information, Promotion and Publications

The collection and dissemination of market information was an integral function and vital contribution of the project. In addition to the countrywide fertilizer and other agri-input situation reports that were prepared for the government and dealers, the Management Information Services unit of ATDP generated a wide array of reliable, timely and useful data with which to make informed decisions on investment and policies. The compendium of profiles of 740

companies, ACF lending trends, project results by sector and region, and case studies will all serve as a valuable resource and provide a solid start for the successor project.

Probably the most recognized and appreciated information output of the project was the monthly *Agribusiness Bulletin*. This publication provided technical advice, news of agribusiness developments and breakthroughs from around the world, notice of relevant international trade shows and conferences, and advertisements of local products and equipment. The issues carried real life case studies on how Bangladeshi agro-enterprises were converting new technologies into profits. Averaging over 20 pages and published in the local Bangla and English languages, the 60 issues of the *Bulletin* reached 7,000 direct subscribers and countless others. A sample survey disclosed that a remarkable 75% of the entrepreneur readers reported that the Bulletin helped them generate new business.

In the campaign to promote adoption of new technologies, the project produced 8 videos and 36 brochures on various topics with an average audience of 10,000. The video promoting USG, for example, received good coverage on national television and through events organized by DAE and BRAC. The technology transfer brochures covered all aspects of the program – from the technology of producing high-yielding wheat seed to preserving shrimp quality.

The project prepared and distributed 56 special reports and 15 feasibility studies on the range of relevant topics, and regularly submitted 7 types of reports on progress of the activities.

Project leadership used the media extensively as a partner to promote agribusiness. Workshops, the launching of new enterprises, news of USG and export breakthroughs, and other ATDP-organized events and press releases garnered extensive coverage in the media and helped the general public and the elite understand the importance, dynamism and potential of agribusiness. In line with its image of credibility and leadership in the transfer of agro-technology, ATDP launched a web site that served as a source of information on agribusiness for outsiders, including foreign suppliers and buyers who made contact with partners via the site.

Other programs were specifically designed to provide enterprises with information on markets, suppliers and technology. ATDP staff responded to requests by clients for types and prices of goods and services, and opened for them the world of the Internet. ATDP joined the USAID Global Technology Network, which facilitated communication and deals between Bangladeshi agribusiness and U.S. suppliers of equipment.

7. Backward and Forward Linkages

Creating industry chains of linkages between producers, suppliers, processors and markets was a primary objective of ATDP. This underlying theme weaves through the activities and functions described in both the preceding and following sections of this report. The efforts during the first half of the project to increase availability of reliable supplies of quality agri-inputs and better technologies led to improved production.

The project endeavored to capitalize on this by expanding linkages between production, processing and marketing. The project demonstrated that such linkages are critical and can be formed, despite the many impediments. In all areas, this process remains at an early stage of development and is not easy to achieve, as experienced by the project.

Examples of successful linkage and vertical integration directly attributable to the project include the poultry, shrimp, seed, agro-processing and potato sectors. They will be described in the following sections of the report. ATDP was able to develop sustainable industry expansion by strengthening and more securely fastening each link in the chain. As a result, project clients have transformed the industries and dramatically increased production, processing, export, and other forms of added value.

Because feed grain is scarce in Bangladesh, for example, the project focused on improving domestic production, total supply and quality to ensure the steady expansion of the poultry industry. Project staff supported local pharmaceutical companies in making more vaccines available for the growing ranks of poultry farmers.

As a result of ATDP help in developing four export production zones, nine enterprises are exporting fresh fruit and vegetables. They procure and pack in the farmers' fields and take the produce to the airport. Through this network, 309 ATDP supported farmers sold 50 tons of crops for export in 1999.

Linkages were developed in many ways, e.g., bringing two groups to the table, holding workshops for complementary industry clusters, promoting trade association events, offering technical assistance for a client's suppliers of raw product and equipment, and organizing trade missions to explore overseas markets and meet new suppliers. In this regard, it is noteworthy that ATDP clients purchased from U.S. suppliers poultry-related equipment worth \$8.2 million and \$1 million in snack food extrusion machinery, in addition to \$90 million in imported fertilizer.

ATDP worked with the:

- Fruit and vegetable processors to establish regular supplies from contract growers,
- Packaging industry to improve the quality and attractiveness of Bangladeshi food products,
- Domestic manufacturers of agro-processing equipment to serve better the needs of their clients, in particular those in the shrimp and horticulture businesses.

Indirect linkages and related job creation also resulted from ATDP activities and agribusiness growth generally. An example is the increased work for makers of ice and for transporters because of growth in the shrimp industry.

III. Development of Specific Sectors and Industries

1. Holistic Approach and Regional Offices

"ATDP has helped us grow and diversify at every stage of development. They exposed us to new ideas and technologies and provided the specific support when we needed it. ATDP has been invaluable to our progress. Just as is PRAN, the IFDC project is a unique success story, and its management deserves the country's congratulations."

- Maj. Gen. (Ret'd) Amjad Chaudhury, CEO of PRAN Industries, in May 2000

In undertaking its mission to develop agro-industry and promote technology development, ATDP adopted a holistic, interwoven strategy that aimed to remove bottlenecks to successful

agribusiness in Bangladesh and nurture the nascent industry. The project offered help to those entrepreneurs who requested it in four key aspects—advice on inputs including technology, business and management training, access to credit, and assistance in marketing.

To obtain outside technical expertise as needed in specific sectors, IFDC management drew on the resources and contacts of its project partners, Ronco Consulting and Winrock International. A dozen short-term consultants from overseas were recruited in addition to many local experts. For the final year, the project on the recommendation of USAID engaged a full time expatriate agribusiness specialist experienced in agribusiness. ATDP leadership also took advantage of other USAID-funded programs, such as the Regional Agricultural and the Farmer-to-Farmer projects. ATDP collaborated and shared information with projects of other donors as well, including those of the World Bank, ADB, IFAD and Canada.

Regional Offices—The project was designed and contracted to be national in scope. It needed regional outposts to establish a presence and regular contact with clients. A pilot office was established in Kapasia because it was near Dhaka, a center of fruit and vegetable production, home to NGO and banking networks, and an area of high growth potential. Based on the lessons learned there, offices were opened in three outlying central locations—Rangpur, Jessore and Chittagong. They enabled coverage to all the main regions.

With the creation of the Development Fund in 1997, the project had additional resources and new programs to promote. Four more regional offices were established to expand coverage and information flows about ATDP assistance—in Sherpur, Rajshahi, Sylhet, and Barisal, bringing the total to eight. All were located in transport and agricultural hubs that allowed relatively easy access to potential agri-enterprises in the focal sectors.

The regional offices were critical to project successes by providing clients with resident expertise and services tailored to local agribusiness priorities and requirements. The reputation, networks and data amassed by the project represent an excellent base on which the next phase can build. The project has identified and supported the key sectors and customers, who are eager to proceed further.

Common Techniques—With guidance and support from the central office and the senior sector specialists in Dhaka, the regional offices pursued similar strategies, support mechanisms and activities for the focal sectors. Project staff studied market opportunities, identified prospective candidates, and organized them into clusters. The staff then held workshops, provided the range of training in technical and business subjects, advertised the support services available, prepared and disseminated brochures and videos, and, in general, introduced potential clients to the ways and means of succeeding in commercial agriculture.

ATDP pioneered the practice of contracting private consultants, agricultural training institutes, and experts from GOB institutes to provide extension services to farmers.

The project organized 280 field days for 41,000 farmers. (Half of the events were related to USG and one-fourth to seed production.) As attitudes changed and new agro-enterprises emerged, the project arranged visits to them and publicized their progress. The in-country study tours to successful pioneers were an effective tool in transferring technology and enthusiasm.

While the vast majority of clients are progressing well in the challenging Bangladesh environment, some have faltered. One reason is the tendency of entrepreneurs to try to handle everything themselves, e.g., procurement, production and marketing. They are reluctant to spend the money and delegate responsibility to technical and field managers.

Upon request, qualified clients received help with pre-feasibility studies, advice and matching grants geared to their particular requirements. Such specialized support, documented in company profiles, was accorded to 2200 firms, as described in the table below.

	Poultry	Shrimp	Fruit/Veg	Dairy	Feed	Seed	Bl. Fert.	USG	Total
New firms	427	158	80	76	13	33	12	489	1288
Existing firms	684	43	83	48	9	42	3	0	912

Although clients were fewer in number in the feed grains, seed, and blended fertilizer sectors, ATDP support had considerable impact because of the critical nature and multiplier

effect of improved inputs and of the relatively higher employment ratio to investment. The client base was narrowed to 740 enterprises during 1999 to allow for more concentrated attention.

The project incorporated the various aspects of technology transfer and agribusiness development in ways that could also help micro-entrepreneurs. The support given to a small NGO in a remote area of the Chittagong Hill Tracts exemplifies this approach. The NGO, called the Mass Organization for Training, Health Education and Rehabilitation (MOTHER) approached the ATDP Chittagong office for technical and marketing help.

- The project provided a grant for a consultant who trained the primarily women members in growing niche crops. Staff approached a local GOB research center, which provided top-quality starter vegetable seeds for free.
- Because MOTHER needed continuing help and had no idea where to turn, ATDP linked them with two USAID-funded projects (Helen Keller International and AVRDC) that had more resources. HKI agreed to provide two agriculturalists and motorcycles for three years to help the members develop a horticulture business.
- To help meet their credit needs, ATDP convinced its ACF partner, Bangladesh Krishi Bank, to provide loans of \$80 each, without collateral, on condition the project staff would train and help the NGO members.
- Middlemen were determining the prices of the output, so the ATDP local office arranged with wholesalers in Chittagong to establish a procurement center in the area. The group now receives fair prices and is looking for ATDP-II to help in the next phase – exporting niche products by air to the overseas ethnic markets.

2. Fruits and Vegetables

The project placed high priority on developing horticulture into an industry. The country has many suitable growing zones where fruit and vegetables are already being widely produced on a subsistence level. Commercial production could take advantage of low-cost labor. There is good processing and export potential, and such increased output would contribute to nutrition and to meeting growing domestic demand.

After identifying the areas and crops with best potential, the project organized training programs for potential commercial growers and processors. The topics covered the range—from quality seed use and production to quality and standards to equipment and marketing. The array of project tools was deployed to stimulate and respond to interest. ATDP worked with GOB research organizations to introduce better seed varieties and thus improve yields and quality needed to support an emerging agro-processing industry.

By encouraging farmers in the Kapasia area to adopt a better variety of pineapple, for example, the project helped them increase yields by 25% and demonstrated how to produce off the peak cycle to achieve higher prices. Staff also encouraged a grower association and negotiated arrangements with buyers to ensure reasonable prices. Similar valuable assistance was provided to guava growers in Barisal who faced problems and heavy post-harvest losses because of low prices in peak season for a product that has a 3-day shelf life and is consumed only as fresh fruit. By teaching them how to make juice and jelly, the producers increased their incomes and are poised to scale up operations.

Larger Earnings from Small Gardens

ATDP provided assistance to a local nongovernmental organization – PAGE, which has 10,700 members (primarily women). PAGE approached ATDP for help after the devastating floods of 1998. The ATDP staff provided technical assistance and training targeted to produce quality vegetables for local markets and for export to ethnic markets in the United Kingdom.

During the first four months of 1999, with ATDP assistance, 300 members were able to ship 20 tons of vegetables worth \$ 34,000. As a result, these small-holder female entrepreneurs increased their incomes by 30%. The project also helped PAGE in installing a hydro-cooling system to increase the shelf life of the vegetables they produce.

Potatoes—While the above case study exemplifies success at the micro level, the potato story is a macro phenomenon. Widely lauded is the role ATDP played in transforming the potato industry—from seed to French fries. Bangladesh produces 1.8 million tons of potatoes, but the average yield of 11.3 tons per hectare is below that of other countries due to poor quality seed and outdated technology. For example, farmers in the US harvest an average of 38 tons per hectare and those in India about 17 tons. By the end of the project, farmers in Bangladesh receiving ATDP technical support were regularly harvesting 25 tons per hectare.

ATDP collaborated with the Bangladesh Agricultural Research Institute (BARI) to commercialize the production of True Potato Seeds, which are sturdier, even if more rustic, and 30% cheaper than the tuber seed the farmers were using. The project also helped a client company become a pioneer in the rapid multiplication of seed potatoes through tissue culture. Quality potato seeds currently represent about 10% of the total market. Under an ATDP initiative, the private sector share of this distribution now surpasses that of the state enterprise that had previously dominated the market.

Simultaneously, the project worked to improve storage, handling, and transport, leading ultimately to the first successful commercial export of potatoes from Bangladesh. With the help of a potato expert from abroad, the project provided advanced technical help to entrepreneurs interested in processing the potatoes into frozen French fries and snack foods. The potato program holds good potential. To promote institutional capacity and sustainable progress, the project initiated formation of the Bangladesh Potato Council.

Export

ATDP embarked in 1998 on a program to accelerate potato marketing and added value through the private sector. The project:

- Organized a trade mission to Singapore, Malaysia and Sri Lanka to assess the markets;
- Motivated and helped Bangladeshi entrepreneurs produce quality potatoes for export;
- Made possible the first large-scale export of potatoes in March 1999. Other shipments soon followed. Exports of potatoes increased in 2000.

Processing

ATDP engaged a U.S. expert to conduct a feasibility study for developing a processed potato industry (such as, frozen French fries, chips, and other snacks) in Bangladesh. The study also assessed the potential for local fabrication of the required processing machines. There was great interest. For example, the project helped a woman entrepreneur start a kitchen operation to produce 20 -30 kg of frozen French fries per day. She now sells an average of 100 kg per day.

In August 1999, a contract was signed between two ATDP-supported entrepreneurs, Polytech Engineering and National Electronics Company (NELCO) for the manufacture and commissioning of a frozen French fry line with a 400 kg per hour capacity. NELCO is now in operation and a pioneer in the production, marketing and sales of frozen French fries in a local market of 80,000 to 100,000 MT annually. Another ATDP-supported entrepreneur will soon set up a 100% export-oriented project for making potato flakes, with annual capacity of 7,200 MT.

To support the potato-processing industry, an ATDP client has retrofitted its cold storage facility to disburse sprout suppressant – the first use of this technology in Bangladesh. It permits potatoes to be maintained at a higher temperature, which is better for processing.

The next project should focus on the many continuing constraints, including quality control, storage and transport capacity, packaging, promotion, and cargo space.

3. Shrimp and Fish

While efforts in the fruit and vegetable industry tended to focus on producers as the center for backward and forward linkages, ATDP keyed on processors for its activities to upgrade the

shrimp sector. Fishing is the third largest export earner for the country, after garments and knitwear. Shrimp accounts for 82% of fish exports and had been growing rapidly until the EU banned and the U.S. FDA detained Bangladesh product on sanitary grounds in mid-1997.

Shrimp represent the country's best agricultural export opportunity in the near term if food safety and supplies can be improved. Output in the country represents only 20% of installed capacity. Losses between hatcheries and plant are high. In 1997 the project therefore began an effort that complemented ongoing activities by others. The holistic ATDP strategy aimed at:

- Training processors, handlers, transporters and storage operators to comply with HACCP.
- Boosting the supply of shrimp by supporting new hatcheries and nurseries and promoting freshwater varieties.
- Reducing losses from mishandling between farm and processor.
- Providing experts in processing efficiency and value-added techniques.
- Improving packaging and marketing.
- Introducing exporters to new market opportunities overseas.
- Strengthening the Bangladesh Frozen Food Export Association and GOB agencies.

The project hired a fisheries expert, engaged consultants, helped with grants and access to credit, and produced useful publications on the HACCP process through the whole shrimp chain and a basic manual on raising freshwater shrimp. The idea was to boost the supply of shrimp to take advantage of underutilized processing capacity and to establish sustainable linkages between hatcheries, nurseries, farms, processors, and export markets.

The project also responded to entrepreneurs wishing to develop fish farms, nurseries and hatcheries. Through the technology transferred in pilot areas, the project increased the productivity and supply system for the small fish farm sector.

An example of a unique contribution by ATDP to the shrimp industry is the introduction of freshwater shrimp farming in non-traditional areas. Farmers in Mymensingh were producing only one crop of paddy rice per year. Project staff convinced them to experiment with adding a second crop of post-larvae shrimp, in combination with carp.

This whole new rotation system has now spread to 15,000 hectares in different regions and is making farmers happy by generating annual net profits of \$3,700 per hectare.

In addition to improving the supply link, the program helps address the adverse environmental impact of harvesting wild baby shrimp.

Much work remains to be done throughout the shrimp system to achieve its potential. There are still problems related to HACCP compliance and production—particularly between the farm and the processor. Overall shrimp exports for the country have not improved. But as exemplified above, there is progress. Through successful trade missions to the United States, Europe, Japan, China and Singapore, the client firms of ATDP identified dozens of new export opportunities and have increased their export volume in 1999 by 23% and export earnings to \$194 million in 1999, compared with \$157 million in 1998.

The next project should focus on such objectives as:

- Continual improvement in HACCP audits and quality assurance.
- The adoption of value-added techniques and equipment during shrimp processing.
- Creating better international awareness of the quality of Bangladesh shrimp.
- Fostering cooperation and economies of scale among the project's current clients.
- Establishing ongoing export arrangements with large US and other importers.
- Expanding hatcheries, nurseries and freshwater shrimp farms in rotation with rice.
- Enforcement of fisheries control regulations.

4. Poultry

Poultry broilers and layers also represent a dynamic growth sector in agribusiness. Rather than looking to export markets as in the case of shrimp, the opportunities for poultry producers are in the fast-growing domestic arena to meet the appetites of an emerging middle class. Similar to shrimp, however, there are serious shortages of day-old chicks to satisfy the demand of poultry

farmers. Insufficient availability of feed grains also constrains growth. Linkages in the industry are weak.

The goals of ATDP therefore centered on augmenting the capacity of hatcheries and feed suppliers and increasing the output, efficiency and quality of egg and meat production. For example, the project:

- Encouraged and supported entrepreneurs to enter the lucrative hatchery business. When the GOB banned the importation of hatching eggs in mid-1999 to boost the local industry, project staff conducted an intensive crash course for managers of 20 selected hatcheries aimed at increasing the supply of quality day-old chicks. Project efforts have contributed to a 30 million increase in chicks among clients.
- Worked with most of the country's hatcheries to improve their breeder stock.
- Helped corollary companies improve feed formulation, vaccines, vitamin additives, diagnostic laboratories, and poultry-related equipment.
- Established pilot model poultry villages to improve farm management and scale.
- Increased the number of newly emerging poultry meat processing operations.
- Provided expertise in marketing, disease control and bio-safety.

Because it is a fairly easy commercial enterprise to enter, thousands of new poultry farms have blossomed in Bangladesh. The project worked with large and small farmers and NGOs, who in turn reached the micro level of the landless and previously unemployed.

The Rahmans of Paragon Poultry, for example, began in 1994 with a flock of 5,000 birds based on chicks imported from India. A project study tour in 1997 convinced Mrs. Rahman to expand and branch out. They bought sheds and equipment from the United States, imported parent stock, and started a hatchery. In 1998 the operation expanded to 100,000 chicks per week from 45,000 birds. They also started a feed mill that produces 35 tons per day and the first private diagnostic center. ATDP sponsored the Rahmans for overseas technical seminars and linked them to farmers. The company created 160 new jobs. Given the 20% annual growth they see in the markets for poultry and eggs, the Rahmans keep expanding. Since 1998 they have again doubled production of day-old chicks.

On a different plane, the project pioneered the working model of a "poultry village" in the Kapasia region, in which a cluster of farmers gain advantages of pooled production to attract

inputs (for example, day old chicks, feed and veterinary services) and to provide marketing advantages. The success of 16 pilots has stimulated considerable interest and plans for replication by others, including the influential Grameen Bank group.

"Thank you for introducing the Grameen Bank staff to the ATDP concept of model poultry and livestock villages, which create a critical mass of activities for attracting inputs... The orientation you provided makes it easier for us to introduce poultry and dairy model villages through our member networks.... We appreciate your cooperation and the success of your program in creating agribusiness opportunities nationwide for the country's entrepreneurs. We look forward to continued work with you."

- Prof. Muhammed Yunus, Managing Director of Grameen Bank in a letter of June 13, 2000 to ATDP Chief of Party Ron Black

Much work needs to be done throughout each stage of the poultry industry. A concerted effort is required to address the continuing shortages of day-old chicks and feed. The successor project should also devote attention to processing and to health precautions.

5. Dairy And Livestock

The project's performance and impact in the nascent dairy sector was not as successful as in other fields. There is scope for growth, as evidenced by the large importation of dairy products into Bangladesh, but the industry is complex and faces serious problems. These include everything from the need for better breeds and sufficient proper feed, to effective control of disease, to sanitary milk collection, cooling, processing and marketing, to more professional management. Local cows are often uneconomic for commercial dairy farming, and imported breeds are expensive and do not always adapt well. Perhaps a more intensive effort is required than the limited resources of ATDP allowed.

The saga of Shurma Dairy demonstrates the difficulties. Some bright entrepreneurs who were schooled overseas thought they could establish a large dairy in Sylhet even without prior experience in dairies or in doing business in Bangladesh. They obtained a loan of \$1 million from a commercial bank under the ACF program to import quality cattle from Australia and set up modern operations. ATDP staff volunteered advice and technical support, but to no avail. They had to watch the cows slowly starve and the farm collapse.

Though progress was slower than desired, there were many success stories. BRAC was able to help 70,000 of its members in dairy production by virtue of a loan from the ACF and technical support from ATDP. Staff developed eight model dairy villages in six regions involving 66 new and re-established small dairy operations. Grameen Bank will be replicating the concept. The project helped five large dairy farms to expand.

Another successful, related aspect of dairy farming was the beef-fattening program. The project was able to convince banks to provide credit year round for this profitable activity and not just during the time leading up to the major religious festival. The project helped promote adoption of urea molasses block and straw to fortify livestock diets. The beef fattening activities were suspended as part of the re-focusing exercise in early 1999.

6. Field Crops

“In Sherpur I met with a young farmer named Moqbal Hossain who had turned that area of the district into the maize-growing capital of Bangladesh. With the help of ATDP he had assembled over 6,000 acres of farmland under a contract-growing scheme that not only benefited farmers by giving them a guaranteed price for their crop, but also benefited the poultry operators who are desperate for reliable sources of quality feed grain.”

- Richard Rousseau, USAID Dhaka in June 2000

In response to demand from the burgeoning poultry and dairy/livestock sectors, ATDP devoted resources to addressing the severe constraint posed by scarce, expensive and mainly imported feed grains. Feed accounts for over 70% of the cost in raising chickens. Such field crops as maize, soybean, sunflower and sorghum are accorded limited acreage in land-scarce, densely populated Bangladesh. Yields were below potential because of outdated seed varieties, and there were few linkages with end-users.

The project helped to develop ten new feed grain enterprises, whose total annual sales reached \$183,000 in 1999, and to expand the businesses of nine existing producers. ATDP introduced 15,775 farmers to improved seed and other technologies. Project staff devoted attention to helping them and traders improve storage and marketing and to establish contract farming of feed grains. Linkages were developed with mills and poultry and livestock farmers.

ATDP, of course, also experienced setbacks along the way in this and in other sectors. For example, the project worked with a large agribusiness firm to contract out the production of soybeans. The soybean seeds were ordered from the one reputable commercial supplier in the country, which for unforeseen reasons provided poor quality seed in unlabeled bags. Adverse weather compounded the situation. Yields by the contract farmers were low so they could not repay the credit extended by the company, which in turn went bankrupt. (Efforts to import better soybean seed from the U.S. have been stymied by the phyto-sanitary regulations of Bangladesh.)

Soybeans offer similar potential to the successes the project had with maize production. There are fallow lands, e.g., in the Sylhet area, suitable for these and other field crops. The storage cocoons imported from the United States by an ATDP-stimulated venture are gaining in popularity and can help address the severe feed grain storage constraint.

In many countries there is a tendency to treat the supply of inputs such as seed, fertilizer and feed grains as a combined function to make effective use of sales and service networks. The next project might want to form an inputs unit whose staff would be flexible enough to work with dealers and other enterprises in all aspects of inputs.

7. Seed

The project achieved significant advances in the seed sector and helped show the commercial potential for this industry, on which growth in agriculture and agribusiness is so vitally dependent. Modern seed production is still in an infant and transitional phase and will probably require 5-7 years of effective effort to reach a stage of sustained take-off. Farm households still account for 90% of all seed, mainly rice, used in the country.

ATDP concentrated on 52 large and small firms, all of which continue to produce and market improved varieties of seed. In 1997 it undertook a study that analyzed the situation in each crop sector and the policy constraints to commercialization, such as the strict regulations covering seed, and the role of the state enterprise that dominated the market. The study identified opportunities for private sector seed producers and initiated a strategy for supporting them and building a clientele to purchase better quality seed.

With ATDP help, private enterprises were able to demonstrate their ability to produce and contract seeds for all crops including hybrids, maintain variety purity, and produce breeder and foundation seeds for their commercial ventures. The case of potato seeds noted above is an example of how the project helped promote a better seed variety.

The growth of the East West Seed company represents an example of success at the enterprise level. From the inception of this Bangladesh-Dutch joint venture in 1996, ATDP provided critical interventions, such as,

- Persuading the GOB to waive duty and other taxes on the seed processing machinery,
- Assisting in obtaining an ACF loan for working capital,
- Partially funding international training for key personnel,
- Awarding matching grants for expert advice on establishing cold storage, management information systems, local and foreign markets, and seed processing technology.

The company produced 50 tons of quality seed for the domestic market in 1997/98, 101 tons the next year and 170 tons in 1999/00, including vegetables and hybrids. In addition, the company exports over 20 tons of vegetable seed per year. The company already engages 500 contract growers and 300 workers, and it invests heavily in R&D.

As was seen in the case of soybean seeds, however, some of the headway in the seed sector was lost due to mixing seed grades and ignoring truth-in-labeling for short-term economic gain and to failure to follow the good field practices taught by project experts. The next project should address these and technical and business training, credit needs, post-harvest storage and handling, processing and effective marketing. In addition to continued efforts to remove policy and regulatory barriers to private seed production, the project should strengthen linkages with the national agricultural research system.

8. Fertilizer

The project's roots were in fertilizer, and it continued to emphasize this critical sector in four major ways:

- The introduction and eventual widespread use of urea supergranules (USG).
- Promotion of the production of blended fertilizer to stimulate balanced fertilization.
- Policy reform and an effective regulatory regime.
- Monitoring/reporting on fertilizer prices and availability, as required by the contract.

USG is one of those agricultural research breakthroughs that make a world of difference in rural development. The saga of exponential growth in use of USG in Bangladesh demonstrates how a well-orchestrated campaign can overcome skepticism, tradition and policy constraints. It exemplifies the virtue and rewards that accrue from reality-based public-private-NGO cooperation.

By deep-placing compacted urea briquettes in the rice fields instead of broadcasting the fertilizer in its usual prilled form, small-scale farmers using labor-intensive techniques are able to achieve 15% higher yields with 30% less nitrogen fertilizer. The result is an increase in profits of over 50%. After demonstrating the remarkable results of this technology that IFDC was instrumental in developing, ATDP engaged the enthusiastic participation of the Ministry of Agriculture and its agricultural extension service. With ATDP training, the NGO, BRAC, also spread the message to its extensive membership.

At the same time, IFDC experts contributed to the design of a low-cost machine to produce the briquettes and helped private agro-machinery companies to manufacture and market it. The project encouraged small USG entrepreneurs by offering training, access to loans and grants, marketing materials, and help in organizing field demonstrations. Thus, the private sector became the third sales force.

Within the space of 3 years, use of USG climbed from a few hundred acres of field trials to one million acres of rice being fertilized in 1999/2000 by over 600,000 small-holder and desperately poor, but now better off, farmers. There are over 500 USG manufacturers covering 75% of the nation's districts. In FY 99/00 an estimated 10,000 additional jobs were created and over \$80 million added to the nation's GDP as a direct result of USG. There are also significant environmental benefits and energy savings from this more efficient use of nitrogen fertilizer. The GOB is experimenting with USG on vegetables and other crops. Work is underway on multi-nutrient briquettes.

"For farmers using USG, hope abounds for better crops and bigger profits."
- Excerpt from a feature article on USG in an official publication of the U.S. Mission to Bangladesh in April 1999

Blended fertilizers availability represents an important way to encourage farmers to adopt a better balanced use of plant nutrients. Rice farmers in Bangladesh tend to satisfy the nitrogen needs of the soil but not those of phosphate and potash and some key micro-nutrients such as sulfur. Partly this reflects the domestic production capacity for urea and the need to import most other raw materials.

The project began to focus on encouraging the production of blended fertilizers by the private sector. Staff and consultants developed a training manual and module on techniques of blending fertilizer and encouraged established dealers and others to venture into the field. They provided advice on machinery and marketing. As a result, thirteen blending plants are now operating. Their sales revenue has tripled in the past few years.

The producers and their distributors serve as agents in the campaign to promote more balanced fertilization by farmers. Fertilizer dealers are effective transmitters of technology. According to a survey by the project, 78% of fertilizer dealers are engaged in additional input supplies such as seed, feed, pesticides and vaccines; 86% provide advice to farmers; and 40% provide credit. The dealers, through their Bangladesh Fertilizer Association (BFA), can also play a role in soil sampling and testing, which should be pursued more extensively. Collaboration with the GOB soil resource specialists might also help institutionalize and commercialize an ongoing program.

Policy and regulatory reform are critical to expanding the production and use of blended fertilizers. Current regulations ban the import of some fertilizers and limit the types of blends to five. Much work is required to follow up IFDC initiatives to establish an effective truth-in-labeling fertilizer regulatory and inspection system. There are also restrictions on the private sector's movement and marketing of urea fertilizer.

The project was successful in gaining agreement from the GOB to remove the restriction on the movement and sales of urea intended for conversion to urea supergranules (USG). Any manufacturer of USG may purchase urea from government plants. Once produced, USG can be

marketed and sold anywhere in the country. This policy reform of free movement contributed significantly to the widespread diffusion of USG technology.

Monitoring and reporting on the fertilizer markets, use, and supply situation was a priority under the original design of the project and was built into the contract requirements. Fertilizer is vital for food security and agriculture, which is the base of the economy and means of livelihood for most of its citizens. The daily, weekly and monthly reports prepared by the ATDP team served as the main source of information and insurance of competitive markets for farmers, dealers, government, USAID and other donors. The project was able to train staff and transfer this essential function to the Ministry of Agriculture, where it is proceeding well.

9. Agri-Machinery and Agro-Processing Equipment

As it surveyed bottlenecks and gaps of the agribusiness system, the project noted that there were no GOB programs to promote local manufacture of demand-oriented farm machinery, much less agro-processing equipment for the newly emerging market. The objective of ATDP was to take advantage of the growing trend toward mechanized farming and encourage local companies to meet this market.

The idea was to concentrate on a few promising machines for the cultivation of the basic crops, such as rice, wheat and maize as substitutes for imports. (Over 100,000 diesel engines were imported in 1997 for agricultural use). The project strategy was to help a few companies demonstrate to others the potential for profit and, thus, stimulate entry into the industry. GOB institutions and programs with engineering components had not been successful in promoting local manufacture of farm machinery, which tended to be supplied under donor programs.

ATDP began an effort to stimulate domestic production of a variety of agricultural-related machinery, from paddy threshers and forage choppers to tomato pulpers and a semi-automated French fry processing line, in addition to the USG briquette machines that were perfected by IFDC. Though the re-focusing of the project in early 1999 aborted this program, the project was able to demonstrate the commercial possibilities for local companies to produce farm machinery and agro-processing equipment.

IV. Conclusions and Recommendations

1. Overall Lessons

Holistic Approach—The project's holistic and demand-driven approaches were the keys to its success, both in terms of generating broad awareness of the opportunities in agribusiness and of nurturing individual enterprises. Thanks to the combination of USAID base support and of the GOB contribution to create the ACF and its companion development fund, ATDP was able to offer to those who requested it an integrated and reinforcing package of assistance.

The project offices and the ACF participating banks represented in effect a two-stop service that could provide emerging agro-entrepreneurs with access to loans, matching grants for technical and business assistance, training, marketing and information support and linkages with suppliers and customers. According to the client firms, no other public, private, NGO or donor program has done that so successfully on such a scale.

Underlying all this, of course, was a fundamental faith in and an understanding of how to tap the interest, ability and entrepreneurial spirit of the private sector. The long-term commitment of USAID in working with IFDC to improve the fertilizer distribution system in Bangladesh helped provide the well-grounded experience and momentum in generating the public-private partnership that set the stage for quick and sustainable results.

Another aspect of the holistic approach to agribusiness development devised by IFDC was the importance of linking different but related sub-sectors, such as the need to produce more and better feed grains, dependent in part on adoption of higher yielding seed varieties, to support the burgeoning poultry and shrimp industries. The project tried to address constraints throughout the commodity chain. In the cases of shrimp and poultry, for example, other critical problems addressed were insufficient hatcheries to supply the required young, HACCP for shrimp, vitamins and disease prevention for chickens.

Given its broad scope and limited resources, ATDP naturally could not solve all of the problems that affect any individual sector. The project made breakthroughs and produced real

results in terms of economic growth, but the process of transforming agribusiness will require a long-term effort with much more commitment and investment.

What ATDP accomplished was demonstrate how the bottlenecks in the target sectors could be removed in a market-driven fashion. These lessons of what works and what did not work will prove valuable to the next phase of ATDP and other agribusiness projects.

Guidance—ATDP evolved over time in reaction to both private sector requests and the interests and priorities of USAID and the GOB agency stakeholders. To satisfy the various objectives, the project tried to meet four sets of ambitious targets and results indicators. Some of the stakeholders emphasized straight economic impact, others assessed results in terms, for example, of employment generation or growth of new enterprises (some favored small, others large) or backward and forward linkages.

The flexible, response-driven approach adopted by the project led to debate in some quarters as to whether there should be sharper geographic and industry focus. There were similar arguments about more policy and strategic analysis to try to ensure maximum impact and sustainability and more emphasis on support for processors. These issues should certainly be considered in designing the next phase of ATDP.

The project steering and other oversight committees provided guidance and direction to the project leadership. The idea was to reach consensus and avoid time-consuming and disruptive diversions when opportunities and problems arose and situations changed. As indicated by the critical nature and extended time frame of the interim evaluation by USAID, the established process and the ATDP leadership were not always successful in adjusting to and balancing the interests of the two main clients in authority—the Ministry of Agriculture and the USAID Mission. For the next phase, the primary parties should clarify from the outset what is expected and how results will be monitored and measured.

ACF—Differing attitudes about the ACF exemplify the problem. It is important to note that after developing the operating modalities for the ACF, the ATDP management had no control

over it. ACF was funded by the GOB, administered by the central Bank of Bangladesh, and implemented on a commercial basis by nine participating lending institutions, which matched ACF flows by two to one with their own resources.

A criticism of the ATDP was that the ACF partner banks tended to make "safe" agribusiness loans, such as working capital to known customers, rather than riskier long-term credit to new firms for capital investments. The objective of ACF, however, was to encourage private and public sector banks to lend to agribusiness. The project documents envisioned that the revolving credit fund would be used in a manner similar to the credit program associated with the previous fertilizer distribution improvement project, i.e., primarily for working capital. In fact, there was concern initially in some quarters that the ACF participating banks would be reluctant to take advantage of the facility or make loans to agribusiness or that they would suffer losses if they did lend.

With ATDP technical assistance to borrowers, the creation of ACF fortunately did encourage the banks to expand credit substantially and successfully and thus made a significant contribution to agro-enterprise development, capacity utilization, and economic growth. The high repayment rates under ACF also reflect the benefit of the banks themselves identifying the borrowers and undertaking their own appraisals.

Perhaps the ACF could take on a more concentrated "development" role under ATDP-II now that there is more liquidity in the system for agribusiness. Any such changes, though, should be decided up front so that project leadership has clear guidance.

Institutions, Such as Trade Associations, NGOs, and GOB Agencies and the Media—
The project clearly demonstrated the effectiveness of agribusiness trade associations as advocates of reform. Politicians and civil servants in Bangladesh do listen to successful businessmen who can present unified positions and cogent arguments. Strengthening the trade associations reaps benefits that improve policy, institutional capacity, enterprise capabilities, food quality, marketing, and information dissemination. *The most important institution, however, and the one*

on which the others depend for relevance and sustainability will be the emergence of strong clusters of agro-enterprises.

Another lesson from ATDP is the value in collaborating with NGOs as a way to leverage resources, extend project reach, and replicate successful pilot activities. The project also strengthened the capacity of the NGOs by encouraging and assisting them in providing technical support along with loans to their members.

Cooperation with government agencies produced similar mutual benefits and results. The Ministry of Agriculture was a supportive partner in promoting private sector, market-oriented development and in helping convince tax and other authorities of the need to remove barriers and accord favorable treatment to agribusiness.

The project made good use of the media as a project partner in promoting individual successes, general opportunities in agribusiness and the benefits of private sector enterprises and market solutions. The *Agribusiness Bulletin* had significant influence on the target audience. Videos and articles produced by ATDP about new technologies were given wide coverage by the media. The quality of reporting on agribusiness improved.

Study Tours—In addition to training and field days, one of the most effective tools was the study tour concept aimed at exposing entrepreneurs to new ways and successful counterparts. In terms of cost effectiveness, the visits arranged within the country were probably most productive. The business missions to nearby countries were also clearly valuable according to clients.

The multi-focus study tours to the United States are more difficult to assess. They also experienced more problems in terms of visas, language capability, and relevance. When they were well structured, however, such tours did have a significant, if less tangible, impact by helping public sector officials and influential agribusinessmen to understand and appreciate the rewards of open markets, competition and public-private partnership.

2. Relative Impact and Value as a Model

Everyone familiar with the project seems to agree that ATDP clearly stands out and made a significant and lasting contribution to the development of agribusiness in Bangladesh. Its main achievement was to generate awareness of the opportunities for millions of farmers and potential entrepreneurs to transform subsistence agriculture into commercial ventures. No other project has gained such widespread recognition and influence.

An example of the brand name value of ATDP is the advertising campaign for NELCO frozen French fries. Ubiquitous posters carry a picture of golden fries and feature the tag line, "Technical Assistance by ATDP, a USAID- supported project". Many other processors use similar messages to promote their products.

An indication of the project's message is that as the ATDP was nearing completion and the future situation and timing of the next phase looked uncertain, project staff joined the ranks of new agribusinesses. Guards, drivers and other staff at ATDP regional offices who had never farmed before began to participate in the training programs and then started shrimp, poultry and dairy enterprises.

In its evaluation of ATDP in early 2000, the Ministry of Planning reported that the GOB wanted the project to accomplish three main objectives and that it had done so. The objectives were:

- Create a favorable environment for establishing private sector agribusiness, including the marketing of agri-inputs.
- Collect and disseminate information that supports agribusiness
- Assist agro-entrepreneurs in gaining access to credit, business skills, and technology and to generate employment.

It is instructive to compare ATDP to other recently completed agricultural projects in Bangladesh to draw lessons for implementing the next phase. According to GOB officials who analyze the results and the official completion reports of agricultural projects in the country, ATDP succeeded more than others for a variety of reasons, including:

- ATDP used an integrated management approach and followed clear lines of responsibility internally and with regard to the Ministry of Agriculture and other GOB agencies. Many

donor projects, such as one to develop food crops, did not sufficiently integrate the various project components. They experienced delays and confusion.

- ATDP used short-term local and expatriate experts to provide practical advice, hands-on technical assistance, and training to entrepreneurs. Consultants used in other projects produced numerous studies but few tangible results.
- ATDP had the advantage of being a technical assistance contract with one implementer; whereas the larger projects funded by the multilateral development banks were a combination of loans to the GOB and grant technical assistance.
- Partly because of the limited size of the grant, ATDP management had to be more creative in leveraging resources and innovative in establishing the development fund.
- Both ATDP and a World Bank-funded project promoted exports of nontraditional, high-value crops and demonstrated the possibilities despite the difficulties. Although such exports were not an explicit target in its mandate, ATDP was successful with potatoes. The Horticultural Export program, funded by the World Bank and the UK, shrank from a planned three pilot products to only one—green beans. The Bank project experienced serious delays, disbursed only \$500,000 of the planned \$12 million in credit, and had to enlist the large NGO BRAC to organize the actual exporting.
- ATDP demonstrated the benefits of working with the private sector. The Bank project highlighted the difficulties of having government institutions, in this case the Hortex Foundation, involved in commercial activities.
- Another Multilateral Development Bank (MDB) project had to cancel over \$50 million in credit because of non-response by the private sector to importing irrigation equipment of the types and in the manner prescribed. The project went through a major readjustment and produced only a fraction of the physical achievements originally anticipated. In contrast, the demand-driven ATDP and partner ACF were fully tapped by the private sector.
- A large MBD-funded shrimp development project reduced its program area from 5,000 hectares to 1,000 and reduced the funding by one-half to \$30 million. At the end, sustainability was uncertain. Some say it was "over-designed." ATDP was crafted by IFDC to incorporate flexibility and to adapt in response to new opportunities.

Of course, ATDP had another primary advantage. It evolved from the USAID-supported and IFDC-managed Fertilizer Distribution Improvement projects. By employing the same implementing organization already familiar with the key players and with proven experience in the private sector, USAID was able to minimize start-up delays. These often exceed 2 years for many other donor projects in Bangladesh, after equally lengthy project development processes.

ABD is planning a large agribusiness development project for the northwest region of Bangladesh. The ADB/FAO project design team has studied ATDP extensively and concluded that it has worked well and should serve as a model and a possible partner for the new program. The ADB plans to adopt many of the ideas and pilots of ATDP, including the ACF. A Canadian farm-to-market project also uses grant and loan programs modeled after ATDP.

USAID and the MOA plan to follow up ATDP with a second phase scheduled to begin in late 2000. The new project will benefit from the proven approaches and activities of the ATDP, which ended in July, and can build on the progress made, while continuing to tackle the substantial constraints to agribusiness development in Bangladesh. The lessons learned and the recommendations from the outgoing team should help the next one adapt more quickly and solidify more effectively the accomplishments and legacy of ATDP.

3. Recommendations for the Future

General—IFDC prepared a study on the implications for Bangladesh of the URAA. It noted that existing agricultural export trade in processed products (excluding shrimp and jute) is insignificant for the country, despite the rapid growth in demand for such products in both the domestic and global markets. There are opportunities for import substitution, e.g., edible oils and dairy products if prices increase, and markets for exports of fruits and vegetables in addition to shrimp.

The URAA report recommended that the GOB adopt a proactive policy approach, in conjunction with the private sector, toward promoting the agro-processing sector. Improvements are needed throughout the system, including technology transfer, market research, infrastructure development, and a favorable policy environment. Specific steps include:

- Identifying niche markets for primary and processed fruit and vegetables abroad.
- Encouraging private investment in marketing and infrastructure for grading, packaging, storage and transport.
- Promoting mechanisms to provide the needed finance and investment.

As part of the assessment, strategy and work plan exercises in the early months, the next phase of ATDP could conduct demand forecasts for agricultural produce and identify particular opportunities and their policy constraints. Due to income elasticity and the emerging middle class, the demand for higher value crops and processed food products is expected to exceed the general annual economic growth rate of 4%-5%.

For example, consumption of fruits and vegetables is estimated to rise from 4.6 million tons currently to 7.5 million tons by 2015. In the same 15-year period, the demand is projected to quadruple for eggs, double for dairy products, and increase by 75% for meat.

ATDP-II will no doubt continue the transition to a more intensively targeted approach in terms of geographic and sectoral focus and of the number and type of clients. There will also likely be increasing emphasis on agro-processing as the center of the commodity chain and industry clusters. ATDP developed profiles on 740 client enterprises that should constitute a good client base on which to build.

As part of the strategy to concentrate project resources on assisting fewer firms, the next project should devote additional efforts to preparing feasibility studies and business plans and to helping arrange longer-term credit, equity investments, joint ventures, and strategic alliances. Few entrepreneurs prepare formal business plans and strategies. Many processors do not know how to assess whether they are operating profitably. ATDP developed and conducted a mini business administration program. It can be expanded and perhaps scaled up and tailored for agro-processing managers for use by private and public educational institutes.

The matching grant programs of ATDP demonstrated that entrepreneurs are willing to contribute to the cost of programs that they value. Thus, there is scope for cost sharing and

recovery for services such as business plan preparation, outside consultants, dues for trade associations, and fees for government services, such as seed, fertilizer and soil testing.

Shrimp—There are vast areas of Bangladesh suitable for shrimp farming, especially for fresh water shrimp and carp in rotation with rice. Given the scope for yields to improve and the continuing surplus of processing capacity, the shrimp industry offers great potential. If properly developed, shrimp could overtake garments as the leading export earner.

The frozen shrimp processing plants were updated in 1998 to meet quality and safety standards of the European Union and United States. The plants, equipment, and quality control staff are now world class. HACCP systems were incorporated. As industry members gain more experience in world markets and strengthen their trade association, they will improve their knowledge expertise of quality factors, product mix, value-addition, and management policies for the industry.

The primary problem to be addressed is the insufficient supply of quality fresh shrimp. Because of plant over-capacity relative to supply of inputs, processors sometimes settle for lower quality shrimp. The traditional ways of harvesting and transporting shrimp to the processors do not sufficiently protect against spoilage and thus compound the supply situation. It is critical that shrimp be packed in ice in insulated plastic boxes and shipped to the plants as soon as possible after harvesting. More education is required along the whole supply chain. In addition, the Ministry of Fisheries must fully enforce relevant sections of the inspection and quality control regulations that have been enacted.

Agri-Inputs—Existing successful agri-input dealers can be sources of investments for themselves, for their suppliers, e.g., of seed, feed and machinery and for their customers. Dealers are already diversified and serve as a channel for technology transfer. Four-fifths of fertilizer dealers distribute other inputs, and 86% of dealers provide advice to their customers. The progressive ones already form a link between seed and feed producers, processors, agri-machinery makers, and the purchasers of such inputs. Such dealers represent a private sector way to overcome constraints and introduce new products that embody better technology. The private

sector network offers an opportunity to link with and be leveraged by the official extension service.

There would seem to be merit in further consolidating the distribution system for all agri-inputs. The project could help dealers in seed, feed, fertilizer, crop protection chemicals and agro-machinery to diversify and become one-stop suppliers and to provide selected extension services. A combined agri-inputs unit would be an efficient way for project staff to reach clients.

Agro-Processing—Similarly, the sectoral units could share experts in post-harvest and agro-processing. Horticulture exporters and processors of different products experience some of the same problems regarding spoilage, quality control, and storage. Equipment, packaging and sanitation requirements are similar for firms that produce fruit juice and milk products. The developed shrimp and the nascent poultry processing industries face similar problems, e.g., scarcity of feed and raw material, and hygiene concerns. Much more work in all agro-processing is needed on the quality and disease control, sanitary and HACCP fronts.

The follow-on project could expand collaboration with GOB institutions that have expertise in such areas as reducing post-harvest losses, food safety and quality, and value-added techniques. The technicians could serve as consultants to assist agribusiness on a commercial basis, along the lines of practices in the United States. The project could promote the introduction of agro-processing and modern agribusiness courses into the universities.

Horticulture—The Bangladesh Cold Storage Association can play a more effective role in building the industry. The problems tend to be business and management related rather than technical. For example, too many of the storage enterprises are operating at less than capacity. Those storing potatoes should view their investment as a public warehouse, not just a potato cold storage. The operators also need to purchase more efficient machinery.

Potato processors should develop their own grower base for raw materials and not just depend on the wholesale markets so that they can ensure reliable supplies of the quality and varieties they need. The next phase should work with the industry trade association to encourage

the production and adoption of potato seeds for the types of potatoes best suited to produce French fries and chips that were recently imported from North America.

More incentives and better research are required on tree crops and fruit technology. Because of concern over food security (and thus preference for annual crops) and lingering uncertainties over land tenure, this sector has not developed as much as it should. It offers improved nutritional and environmental benefits as well as potential profits. ATDP's assistance in 1999 to new growers of mandarin oranges in Sylhet is an example of how such niche markets can be developed.

Balanced Fertilizer—Restoration and maintenance of soil fertility are critical to agribusiness development. Most farmers in Bangladesh are not applying sufficient amounts of phosphate, potash and other minor plant nutrients to the soil. Most (80%) of land is owner operated, and farmers can thus be encouraged to invest in the fertility of their soil. Action is needed to promote balanced fertilization, including production and marketing of blended fertilizers. The Bangladesh Fertilizer Association should become more involved in promoting blended production and a regulatory regime that ensures farmers of truth in labeling.

Dealers and GOB institutions can help promote soil sampling. The MOA needs to develop a cadre of 15-20 well-trained, paid, and equipped fertilizer inspectors. The Ministry should also continue to encourage research on multinutrient supergranule fertilizer and to enter a joint venture fertilizer operation with a large multinational firm.

Poultry—The production of both layers and broilers is growing in popularity because of the demand, relative ease of market entry, and profitability. For example, ATDP was able to stimulate a doubling of poultry production in 1999. It is important to remember that the potential scope also depends on protection from the Indian market, which could overwhelm the industry in Bangladesh because of lower feed cost and other advantages.

The constraints include more than only a shortage of day-old chicks and sufficient feed. The poultry growers also need better formulation of feed in addition to the ingredients.

Computers can help millers determine the optimal mixes at the lowest cost. Unless production costs of poultry can be lowered significantly—particularly for feed - which accounts for over 70% of the total expenses, Bangladesh will not be able to export poultry products. New storage facilities for feed grain would give poultry producers better supplier options, such as the U.S., rather than having the grain hauled in trucks from India and Myanmar in small amounts.

The processing of poultry meat is just getting underway and will require extensive project support in all aspects, particularly domestic marketing and sanitary handling.

Seed—Bangladesh requires about 475,000 tons of all types of seed annually. Due to poor quality of seed used now, over 700,000 tons is actually planted. If subsidies for government-related organizations producing and distributing seed are removed, the private sector will respond. There are dual benefits from liberalized, competitive, private sector markets for seed. Given the growing conditions, labor supply, and scope for both domestic and export markets, Bangladesh would seem to have a comparative advantage in seed production as an industry and a generator of employment. In addition, farmers would have better access to high-yielding varieties, thus contributing to food security.

Feed Grains—Better seed availability would translate into higher production of the feed grains needed to supply the poultry, dairy and livestock industries. A key constraint for feed grain dealers and customers is the lack of storage facilities. As noted above under poultry, if ways can be found to assist feed grain dealers, processors and poultry/livestock enterprises to construct storage facilities, this would lower costs by opening options and economies of scale. The current port facilities, of course, impose a constraint on all imports and exports.

There could be good opportunities for the domestic agri-machinery and agro-processing equipment industries to grow along with agro-processing if they are given some nominal duty protection to allow manufacturers to become more solidly established.

Regional Offices—Because of the investment already made, the client base developed, and their name recognition, it would seem to be preferable to retain as many of the ATDP

regional offices as possible. The next phase can also extend its reach and work through collaboration with other local organizations, such as chambers of commerce. Below are some suggested locations and priority sectors where the project should focus (in addition to the Headquarters office in Dhaka, which can also cover poultry and horticulture in Kapasia):

Barisal—shrimp, poultry, seed and feed grain

Chittagong—horticulture, poultry, shrimp

Jessore—shrimp, poultry, seed and feed grain

Mymensingh—shrimp, poultry, horticulture

Rajshahi—horticulture, poultry, seed and feed grain

Rangpur—poultry, horticulture, seed and feed grain

Sylhet—horticulture, poultry, agri-machinery and equipment

Client Selection—Since the new project will not be able to use the ACF's Development Fund to cover staff salaries, the employees will have to be reduced to about one-half of the 170 staff employed at the peak of ATDP. The new team will have to focus and be more selective among those clients requesting help. It will be important to assess the commitment, ability, and risk potential of candidates for intensive support. Cost-sharing requirements can help determine qualified entrepreneurs. Matching grants under the development fund could be limited to only selected clients, now that broad interest in agribusiness has been generated.

Trade Associations—Agribusiness trade associations can play a crucial role in ensuring continuing technical and business services for small and medium agro-enterprises. Well-developed trade associations provide sustainable private sector institutional capacity and also strengthen civil society. In view of limited GOB and donor resources, private sector financing is the only realistic and enduring solution to ensure sufficient support systems.

Properly structured and grounded, trade associations offer a mechanism for individual enterprises to become better competitors. Good associations provide technical and management assistance, market and procurement analysis, in addition to policy advocacy. Trade associations represent a natural progression of entrepreneurial development. Given the Bangladesh situation, it is important that trade associations provide sufficient benefits to attract and sustain

membership, so as to create self-financing, democratic organizations that can avoid political and factional feuds.

The trade associations offer a way to institutionalize the services facilitated by ATDP and establish linkages with public sector organizations and incorporate fee-for-service practices. Just as they do in the United States, the trade associations in Bangladesh can help ensure food safety and quality and develop new markets. In addition to a cadre of solid agro-enterprises, it was envisioned that the next phase of ATDP would institutionalize self-financed service within the private sector as part of its lasting legacy.

Banking and Finance—Because of the training that bankers received under ATDP, they now understand better the risks, needs and opportunities for agro-enterprises. The next project can try to move the ACF participating financial institutions toward new and longer-term investments. How to generate capital investment into agribusiness remains a challenge. The new \$20 million investment fund announced by the GOB in June 2000 could be a helpful factor in this regard.

Study Tours and Trade Missions—There is room for improvement in arranging the study tours to generate more impact. The next project should start planning earlier to ensure focus and likely impact and to resolve problems in obtaining visas. It would be useful to organize the tours to be similar to a trade mission with better advance preparation and individual appointments in addition to group sessions. The mission objectives should include identifying market niches and establishing business relationships.

Marketing Support—Market demand is not a hindrance to agribusiness growth in Bangladesh. However, farmers view marketing as a primary constraint, due in part to the perishable nature of their products, limited storage and transport, and seasonal over-supply that depresses prices. Part of the problem is lack of supply and demand information. The next project will have to continue to address those and other problems, including quality control, packaging, promotion, and cargo space.

The new project, like the previous one, should retain flexibility because the economics of an industry and client demands can change rapidly due to both market conditions and the sensitivity to policies. For example, if even nominal protection is accorded local agro-equipment manufacturers, new business opportunities will emerge.

4. Final Thoughts

ATDP played a crucial and catalytic role in the development of agribusiness in Bangladesh. Other donor-sponsored projects with similar elements preceded and paralleled ATDP. None, however, attempted such a comprehensive scope nor achieved a similar national impact on enterprise development, policy reform, and institution building. The legacy of ATDP is that by successfully demonstrating tangible results in a wide spectrum the project was able to motivate entrepreneurs and public-sector and NGO support organizations to view agribusiness as a path to economic progress.

USAID and the Ministry of Agriculture were able to use the success of ATDP to argue for GOB policy changes that improved the climate for agribusiness. The receptivity of the government to the basic philosophy of the project has helped set the stage for progress. The banking sector now recognizes the value of lending to agro-entrepreneurs, who are now eager to expand operations and move into new frontiers.

The project pioneered new approaches, notably holistic and flexible packages of services aimed at the private sector on the basis of demand. It explored a variety of previously untested or poorly attempted opportunities in agricultural production, processing and export. Venturing in such uncharted areas involves taking risks, making tough choices, and experiencing disappointments. There is always room for improvement.

New ideas should certainly be considered in the design of the successor project, so that it evolves and capitalizes most effectively on the pilot activities, accomplishments, and reputation established by ATDP. It would be wise to retain the foundations of ATDP.

IFDC believes that a primary reason that ATDP succeeded so well where other projects produced only mixed results is because it responded to, rather than attempted to influence, market forces and opportunities. In a similar vein and in contrast to many other projects, the staff of ATDP saw themselves as hands-on problem solvers and as providers of requested, and therefore valued services, to eager private sector clients.

This is the spirit and genius of ATDP that we hope will survive and be transformed over the next five years into sustainable incarnations.

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Appendix 1

Results Achieved through June 2000 **

Results	Unit	ATDP Program Areas								Target through June 2000	Performance of Actual over target (%)
		Seed and Field Crops	Fertilizer	Horticulture	Agri-machinery and Agro-processing Equipment	Livestock, Poultry and Fisheries	Agro-processing	Multi-Sectoral	Total		
Number of farmers with increased incomes, using more productive, environmentally-sound technologies	(000)	19.24	649.42	1.85	25.01	6.90			702.42	100	702%
Number of contract growers/pilot zones initiated with private business investments	(1)	131		23			10		164+8 ¹ = 172	80	215%
Agricultural productivity through number of agribusinesses increased	(1)	4,737	357	23	571	6,511	477	12	12,688	7,000	181%
Agricultural productivity through amount of agribusiness investments increased	(million US\$)	34.05	88.23	0.02	5.65	40.47	79.81	8.96	257.18 ² (ACF – 154.15, Equity – 103.03)	100	257%
Agricultural productivity through number of agribusiness employees increased	(000)	17.50	18.07	0.44	3.16	25.02	4.45		68.64 (ACF – 40.75)	130	53% *
Policy Reforms ³	Policy Weight	190	60	65	95	275	175		860	750	115%

- Note:
1. Including eight field offices at Kapasia, Rangpur, Chittagong, Jessore, Sylhet, Rajshahi, Sherpur and Barisal.
 2. Of the \$ 257 million, \$ 154 million was from Agribusiness Credit Fund (ACF). The \$ 154 million includes \$ 49 million or 32 percent from the Government's fund and \$ 105 million or 68 percent from the bank's own matching fund. The equity share of 40 percent from the entrepreneurs was \$ 103 million.
 3. ATDP measures progress of policy reform through its policy matrix. ATDP's 1999 policy matrix has been prepared based on policy issues identified by private sector entrepreneurs, public officials and professional consultants. It also includes issues identified in the 1997, and 1998 ATDP policy census. Each of the eight ATDP program areas has been assigned 400 points and another 400 points have been assigned for multi-sectoral policies, making a total 3,600 points. The weight of individual policy opportunities and progress toward achieving them is based on the judgement of ATDP senior staff tempered by the opinions of experts for the 1999 policy matrix.
- In addition, indirect employment of 71,500 was generated through support to Bangladesh Rural Advancement Committee (BRAC) and Poverty Alleviation Gender Equity and Environment Development (PAGE)/Comilla.

**Number of Entrepreneurs Developed/Strengthened/Re-Established by ATDP
Through Direct Intervention by Sector and by Region
From May 1995 Through April 2000**

ATDP Sector	Dhaka	Kapasia	Rangpur	Jessore	Chittagong	Sherpur	Sylhet	Rajshahi	Barisal	Total
Fruits and Vegetables	28	2	41	27	5		40	16	39	198
Shrimp			1	141	14	23	2		17	198
Poultry	11	200	95	566	46	20	9	118	95	1,160
Dairy	2	6	56	2,570	26		9		19	2,688
Feedgrain	3		4	8		1	1		5	22
Seeds	19	1	22	12	9	2	2	11	6	84
Blended Fertilizer	3	4	5	2	1					15
USG	4	87	82	25	31	142	16	95	7	489
Total	70	300	306	3,351	132	188	79	240	188	4,854

Appendix 3

Number of New Entrepreneurs Developed by ATDP by Sector and by Region From May 1995 Through April 2000

ATDP Sector	Dhaka	Kapasias	Rangpur	Jessore	Chittagong	Sherpur	Sylhet	Rajshahi	Barisal	Total
Fruits and Vegetables	10	1	16	27	4		3	2	17	80
Shrimp				117	3	23			15	158
Poultry		200	50	50	41	10	7	22	47	427
Dairy		6	24	10	14		6		16	76
Feedgrain	3		3	4			1		2	13
Seeds	7		11	3	1	3		6	2	33
Blended Fertilizer	2	4	3	2	1					12
USG	4	87	82	25	31	142	16	95	7	489
Total	26	298	189	238	95	178	33	125	106	1,288

**Number of Entrepreneurs Aailed
Support for Technology Acquisition and Mastery Program (STAMP)
and Program of Assistance to Borrowers From the ACF (PABA)
Grants of ATDP From May 1995 Through June 2000**

ATDP Sector	STAMP			PABA		
	Regular Grant	Micro Grant	Total	Regular Grant	Micro Grant	Total
Seed & Filed Crops	14	8,973 (76)	8,987 (90)	1	2,897 (23)	2,898
Fertilizer	116		116	4		4
Horticulture	6	6,131 (23)	6,137 (29)		1,040 (4)	1,040
Agri-machinery	6		6	3		3
Livestock	7	3,174 (7)	3,181 (14)	2	70,310 (9)	70,312
Poultry	12	2,516 (41)	2,528 (53)	7	15,040 (3)	15,047
Fisheries	18	2,834 (15)	2,852 (33)	4	59 (3)	63
Agro-processing	43	350 (8)	393 (51)	1	60 (2)	61
Multi-sectoral		720 (3)	720 (3)			0
Total	222	24,698 (173)	24,920 (395)	22 (14)	89,406 (90)	89,428

Note: Figure in parenthesis indicate number of agreements concluded to benefit the entrepreneurs, specifically micro-entrepreneurs.

Appendix 5

Number of In-country Training Programs Organized by ATDP by Sector From May 1995 Through June 2000

ATDP Sector	Number of Training	Number of Participants								
		Commercial Farmer	Entrepreneurs	Dealers	Govt Official	NGO Representative	Other	Total	Men	Women
Fruits and Vegetables	54	630	468	2	183	165	400	1,848	1,657	191
Shrimp	24	195	499		31	13	30	768	750	18
Poultry	69	134	2,662		62	36	148	3,042	2,493	549
Dairy	42	928	535	16	20	129	30	1,658	1,415	233
Feedgrain	15	2,296	81	72	53	56	9	2,567	2,500	67
Seeds	96	1,935	494	343	133	458	586	3,949	3,787	172
Blended Fertilizer	7	59	1	188			31	279	247	32
USG	87	443	198	279	4,960	142	319	6,341	6,162	179
Multi Sector	23	79	556	30	57	82	445	1,249	1,168	81
Others	27	177	332	90	117	37	294	1,047	863	184
Total	444	6,876	5,826	1,020	5,616	1,118	2,292	22,748	21,042	1,706

**Number of Field Days/Field Demonstration Organized by ATDP by Sector
From May 1995 Through June 2000**

ATDP Sector	Number of Participants									
	Number of Field Days	Commercial Farmer	Entrepreneurs	Dealers	Govt Official	NGO Representative	Other	Total	Men	Women
Fruits and Vegetables	31	942	78		25	9	71	1,125	1,020	105
Shrimp	5	139			1		4	144	144	
Poultry	15	337	197		12		91	637	572	65
Dairy	19	640	69		27		61	797	716	81
Feedgrain	18	553	98		95		51	797	723	74
Seeds	47	9,591	206		319		197	10,313	9,996	317
Blended Fertilizer	7	1,275	54		145		61	1,535	1,525	10
USG	128	16,009	1,161		2,962		597	20,729	20,312	417
Multi Sector	1		6					6	6	
Others	9	112	115		29		4,685	4,941	3,783	1,158
Total	280	29,598	1,984	0	3,616	9	5,818	41,024	38,797	2,227

Number of International Training Programs Implemented by ATDP From May 1995 Through June 2000

ATDP Sector	Fund	Number of Programs	Number of Participants			
			Private Entrepreneurs	Banks, NGO's and Govt Officials	Others	Total Participant
Fruits and Vegetables	ACFDF	17	44	11	9	64
	USAID	4	12	3	3	18
Shrimp	ACFDF	3	8		2	10
	USAID	0				0
Poultry	ACFDF	9	25	1	3	29
	USAID	1	1			1
Dairy	ACFDF	2	4	1	1	6
	USAID	0				0
Seed and Feedgrain	ACFDF	15	29	8	3	40
	USAID	1	1			1
Fertilizer (Blended and USG)	ACFDF	9	21	10	3	34
	USAID	2	2	4	1	7
Multi-sectoral	ACFDF	36	16	76	11	103
	USAID	6	2	8	2	12
Total	ACFDF	91	147	107	32	286
	USAID	14	18	15	6	39

Number of Technology Transfer Brochures Produced by ATDP From May 1995 Through June 2000

Sl. No.	Subject	Date of Publication	Type of Intended Message	Distributed to Whom
1	Fertilizer blending (benefit and opportunities in Bangladesh)	October 1995 (3,000)	<ul style="list-style-type: none"> • What is fertilizer blending • Blending plants • Process flexibility • Logistics • Financial Side <ul style="list-style-type: none"> * capital cost * production cost * weather considerations • Considerable affairs on fertilizer blending • Usefulness and opportunities 	BFA Dy. Directors DG Extension BARI BARC BIRRI Entrepreneurs USAID MOA ATDP Regional Offices
2	Cattle-feed (urea-molasses-block (UMB))	February 1996 (5,000) November 1998 (3,000)	<ul style="list-style-type: none"> • What is the UMB • Advantages of using UMB • Preparation of UMB • Preservation of UMB • Process of UMB feeding • Facilities of UMB • Cautions 	DG (Department of Livestock Services) DLO, Gazipur DLO, Bogra ATDP Regional Offices Others
3	Single super phosphate (SSP)	April 1996 (5,500) June 1998 (5,000)	<ul style="list-style-type: none"> • Necessity of phosphate • Variation of phosphate • Nature and manufacturing of SSP • Nutrient content of SSP • Advantages and disadvantages of SSP • Comparative statistics of various fertilizers 	DAE BFA Field Day and Others ATDP Regional Offices
4	Beef fattening	July 1996 (5,000) December 1998 (3,000)	<ul style="list-style-type: none"> • Introduction • What is beef fattening • The goal of beef fattening • Advantages of beef fattening • Considerable issues to establish a beef fattening farm • What kind of cow-shed is appropriate • Considerable matters at the time of purchasing animal • What kind of food appropriate for beef fattening • Table of beef fattening feed stocks • Cautions 	DG (DLS) DG (AIS) Agriculture Fair Entrepreneurs NGOs Unemployed youth ATDP Regional Offices Others

Number of Technology Transfer Brochures Produced by ATDP From May 1995 Through June 2000

Sl. No.	Subject	Date of Publication	Type of Intended Message	Distributed to Whom
5	Establishing a dairy farm	July 1996 (5,000) December 1998 (3,000)	<ul style="list-style-type: none"> • The goal of beef fattening • Usefulness of dairy farms • Site selection for dairy farms • Cow sheds • Cow selection • Sources of improved varieties • Nursing of cows • Health attendance • Food and drink • Calf nursing • Calf food • Improved variety cow produce in the farm • Marketing • twenty cow farming project • Description of loan payments 	DG (DLS) DG (AIS) Farmers NGOs Agriculture fair ATDP Regional Offices Others
6	Cow Feed: Urea Molasses Straw (UMS)	July 1996 (5,000) December 1998 (3,000)	<ul style="list-style-type: none"> • What is UMS • Usefulness of UMS • Process of manufacturing UMS • Proportional ingredients for manufacturing UMS • Facilities for UMS • Cautions 	DG (DLS) DG (AIS) Farmers NGOs Agriculture fair ATDP Regional Offices Others
7	System and procedure of soybean cultivation	December 1996 (5,000) November 1997 (3,000)	<ul style="list-style-type: none"> • Approved variety • Soil & whether • Land preparation • Time of seed plantation • Fertilizer quantity • In-column apply • Mixing system of in-column • Seed plantation • Disease and protection • Duration and yield • Harvesting • Nursing • Pest and protection • Post-harvest operation 	Farmers DG (DAE) Dealers NGOs Govt officials ATDP Regional Offices
8	Support for Technology Acquisition and Mastery Program (STAMP)	November 1996 (1,000) December 1996 (2,000) March 1997 (1,000) July 1998 (5,100)	<ul style="list-style-type: none"> • What STAMP is • Who can qualify for a STAMP grant • What STAMP does • What STAMP Funds • How STAMP works • More about ATDP 	Pvt entrepreneurs Bankers ATDP Regional Offices

Number of Technology Transfer Brochures Produced by ATDP From May 1995 Through June 2000

Sl. No.	Subject	Date of Publication	Type of Intended Message	Distributed to Whom
9	Program for Assistance to Borrowers from the ACF (PABA)	November 1996 (3,000) March 1997 (3,000) March 1998 (3,050) March 1999 (3,000)	<ul style="list-style-type: none"> • What PABA is • Who can qualify for a PABA grant • What PABA does • What PABA Funds • How PABA works • More about ATDP 	Pvt entrepreneurs Bankers ATDP Regional Offices
10	Information on Markets and Technology (INFOMAT)	November 1996 (3,000) March 1997 (3,000) March 1998 (3,025) March 1999 (3,075)	<ul style="list-style-type: none"> • What INFOMAT is • Who can qualify for a INFOMAT grant • What INFOMAT does • What INFOMAT Funds • How INFOMAT works • More about ATDP 	Pvt entrepreneurs Bankers ATDP Regional Offices
11	Market Access and Technology Training Program (MATT)	November 1996 (1,000) December 1996 (2,000) March 1997 (1,000)	<ul style="list-style-type: none"> • What MATT is • Who can qualify for a MATT grant • What MATT does • What MATT Funds • How MATT works • More about ATDP 	Pvt entrepreneurs Bankers ATDP Regional Offices
12	STAMP Bengali Version	June 1997 (5,000) March 1999 (3,150)	<ul style="list-style-type: none"> • What STAMP is • Who can qualify for a STAMP grant • What STAMP does • What STAMP Funds • How STAMP works • More about ATDP 	Private entrepreneurs, Bankers ATDP Regional Offices Others
13	PABA Bengali Version	June 1997 (5,000) March 1998 (3,070) March 1999 (3,150)	<ul style="list-style-type: none"> • What PABA is • Who can qualify for a PABA grant • What PABA does • What PABA Funds • How PABA works • More about ATDP 	Private entrepreneurs, Bankers ATDP Regional Offices Others
14	INFOMAT Bengali Version	June 1997 (5,000) March 1998 (3,030) March 1999 (3,150)	<ul style="list-style-type: none"> • What INFOMAT is • Who can qualify for a INFOMAT grant • What INFOMAT does • What INFOMAT Funds • How INFOMAT works • More about ATDP 	Private entrepreneurs Bankers ATDP Regional Offices Others

Number of Technology Transfer Brochures Produced by ATDP From May 1995 Through June 2000

Sl. No.	Subject	Date of Publication	Type of Intended Message	Distributed to Whom
15	MATT Bengali Version	June 1997 (5,000)	<ul style="list-style-type: none"> • What MATT is • Who can qualify for a MATT grant • What MATT does • What MATT Funds • How MATT works • More about ATDP 	Private entrepreneurs Bankers ATDP Regional Offices
16	Pineapple Growing	July 1997 (2,000) February 1998 (2,000)	<ul style="list-style-type: none"> • Pineapples variety • Pineapple growing system • Detail Technical information on pineapple 	Farmers ATDP Regional Offices others
17	1,000 Layer Farming Project	July 1997 (5,000) November 1998 (3,000)	<ul style="list-style-type: none"> • How Layer farm could be managed • How can you success in Layer farming • Detail Technical and Managerial information on 1,000 birds layer farm 	Private entrepreneurs Farmers Govt officials NGOs ATDP Regional Offices
18	Broiler Farming	July 1997 (5,000) November 1998 (3,000)	<ul style="list-style-type: none"> • What is Broiler • What are the objectives of broiler farming • Detail Technical information on broiler farming 	Private entrepreneurs Farmers NGO officials Govt officials ATDP Regional Offices
19	Urea Super Granular (Bengali)	May 1997 (10,000) November 1997 (10,000) April 1998 (20,000)	<ul style="list-style-type: none"> • What is USG • Why its application is profitable • How to apply USG 	Private entrepreneurs ATDP Regional Offices
20	ACF Brochure	June 1996 (2,000) November 1997 (10,000) March 1999 (3,150)	<ul style="list-style-type: none"> • What is ACF • What ACF does • Terms of lending • How and where to apply • Who can borrow 	Private entrepreneurs Bankers ATDP Regional Offices
21	DAP Brochure (Bengali)	January 1998 (10,000)	<ul style="list-style-type: none"> • Qualities of DAP • Advantages of DAP use • How to use DAP 	Private entrepreneurs ATDP Regional Offices
22	ATD project Brochure	January 1998 (10,000) March 1999 (3,160)	<ul style="list-style-type: none"> • Project overview • Technical Assistance • Finance and Credit provision • Enterprise Development • Policy Analysis and reform assistance • Management Information collected and disseminate • Results 	Private entrepreneurs, Bankers Govt Officials ATDP Regional Offices Others

Number of Technology Transfer Brochures Produced by ATDP From May 1995 Through June 2000

Sl. No.	Subject	Date of Publication	Type of Intended Message	Distributed to Whom
23	Milk product cheese	July 1997 (5,000) April 1998 (3,000)	<ul style="list-style-type: none"> How to prepare cheese Cheese's potential as agribusiness 	Private entrepreneurs ATDP Regional Offices Others
24	Fertilizer Blending (benefit and opportunities in Bangladesh)	July 1998 (5,000)	<ul style="list-style-type: none"> What is fertilizer blending Blending plants Process flexibility Logistics Financial Side <ul style="list-style-type: none"> * capital cost * production cost * weather considerations Considerable affairs on fertilizer blending Usefulness and opportunities 	Private entrepreneurs MOA USAID ATDP Regional Offices
25	Agri-machinery and Agro-processing equipment program brochure	September 1998 (500)	<ul style="list-style-type: none"> Description of agroprocessing equipment produced in Bangladesh Pre-harvest machines Post-harvest machines Agroprocessing equipment 	Private entrepreneurs MOA USAID ATDP Regional Offices
26	For More Production Use of USG Technology in Hybrid Rice	November 1998 (10,000)	<ul style="list-style-type: none"> Use and method of application of USG in rice 	Private entrepreneurs MOA USAID ATDP Regional Offices
27	Seed Potato Production of Modern Variety	February 1999 (5,100) December 1999 (1,500)	<ul style="list-style-type: none"> Improved potato production technology 	Private entrepreneurs Farmers Govt officials NGOs Traders ATDP Regional Offices
28	Blended Fertilizer	August 1999 (20,000)	<ul style="list-style-type: none"> Establishment and production of small blended fertilizer enterprises 	Private entrepreneurs MOA USAID ATDP Regional Offices
29	USG Brochure (UMS)	May 1997 (10,000) April 1998 (20,000) August 1999 (5,000)	<ul style="list-style-type: none"> Use and benefit of USG deep placement 	Private entrepreneurs MOA USAID ATDP Regional Offices
30	TPS to Tuberlet and Tuberlet to Table Potato Production Technology	August 1999 (3,000)	<ul style="list-style-type: none"> True potato seed to tuberlet production and tuberlet to table potato production technology 	Farmers Private entrepreneurs Govt officials NGOs Traders ATDP Regional Offices

Number of Technology Transfer Brochures Produced by ATDP From May 1995 Through June 2000

Sl. No.	Subject	Date of Publication	Type of Intended Message	Distributed to Whom
31	High Yielding Rice Seed Production Technology	August 1999 (3,000) December 1999 (2,000)	• Good quality rice seed production technology	Farmers Private entrepreneurs ATDP Regional Offices
32	Diagnoses and Treatment of Poultry Diseases	February 2000 (1,000)	• Diagnoses and treatment of poultry diseases	Private entrepreneurs Farmers Govt officials ATDP Regional Offices
33	Shrimp Quality Preservation	June 2000 (5,000)	• HACCP based Shrimp quality preservation from farm to factory	BFFEA Dept of Fisheries Govt officials Shrimp growers Nurseries and depot operators
34	High Yielding Wheat Seed Production Technology	August 1999 (5,000)	• Good quality wheat seed production technology	Farmers Private entrepreneurs ATDP Regional Offices
35	Stickers of USG	October 1998	• Use and benefit of USG deep placement	Entrepreneurs Extension personnel BADC BCIC USAID MOA BRAC ATDP Regional Offices
36	Posters	September 1998	• Use and benefit of USG deep placement	USG entrepreneurs Extension personnel BADC BCIC USAID MOA BRAC ATDP Regional Offices

Note: DG=Director General, DLO=District Livestock Officer, BFA=Bangladesh Fertilizer Association, BARI=Bangladesh Agriculture Research Institute, BARC=Bangladesh Agricultural Research Council, BRRI=Bangladesh Rice Research Institute, USAID=United States Agency for International Development, MOA=Ministry of Agriculture, DAE=Department Agricultural Extension, AIS=Agricultural Information Services.

Number of Technology Transfer Videos Produced by ATDP from May 1995 through June 2000

Sl. No.	Subject	Date of Publication	Type of Intended Message	Distributed to Whom
1.	Blended Fertilizer – Its Opportunities and Prospect in Bangladesh (Bangla version)	March 2000	Use and benefit of blended fertilizer	DAE USAID BFA MOA ATDP Regional Offices
2.	Blended Fertilizer – Its Opportunities and Prospect in Bangladesh	March 2000	Use and benefit of blended fertilizer	DAE USAID BFA MOA ATDP Regional Offices
3.	Use Docu-Drama (Mukta)	November 1998	Use and benefit of USG deep placement	USG entrepreneurs Extension personnel BADC BCIC USAID MOA BRAC ATDP Regional Offices
4.	Use Technical Video	November 1998	Use and benefit of USG deep placement	USG entrepreneurs Extension personnel BADC BCIC USAID MOA BRAC ATDP Regional Offices
5.	Use of Good Seeds	September 1998	Benefits of good quality seed use	Private seed dealers ATDP Regional Offices
6.	Prospect and Future of Horticulture	March 1999	Prospect and future of horticulture in Bangladesh	Exporters Growers ATDP Regional Offices
7.	Milk Processing (Bangla version)	January 2000	Technology of preservation and processing of value added milk and milk products	Dairy Farmers Entrepreneurs Processors NGOs DLS ATDP Regional Offices
8.	Shrimp Industry in Bangladesh	June 2000	Shrimp production and processing for export	Bangladesh Frozen Food Exporters Association Dept of Fisheries Govt Officials ATDP Regional Offices

Increase in Annual Sales Revenue of ATDP Supported Entrepreneurs by Sector

ATDP Sector	Number of Sample Entrepreneurs	Annual Sales Revenue (million Tk)		Increase In	
		Prior to ATDP	1999	Amount (Million Tk)	Percentage
Fruits and Vegetables	50	340.76	1,097.11	756.35	222%
Shrimp	22	7,765.44	9,895.32	2,129.88	27%
Poultry	351	617.96	1,756.25	1,138.29	184%
Dairy	71	1,190.00	2,973.85	1,783.85	150%
Feedgrain	11	3.34	3.85	0.51	15%
Seeds	20	33.07	204.71	171.64	519%
Blended Fertilizer	10	10.98	33.56	22.58	206%
USG	205		207.90	207.90	
Total	740	9,961.55	16,172.55	6,211.00	62%

Increase in Employment of ATDP Supported Enterprises by Sector

ATDP OSector	Number of Sample Enterprises	Employment									Percentage Increase in Total Employment
		Prior to ATDP Support (Number)			1999 (Number)			Increase (Number)			
		Men	Women	Total	Men	Women	Total	Men	Women	Total	
Fruits and Vegetables	50	666	670	1,336	1,326	1,282	2,608	660	612	1,272	95%
Shrimp	22	2,691	2,761	5,452	2,857	2,980	5,837	166	219	385	7%
Poultry	351	769	81	850	2,193	297	2,490	1,424	216	1,640	193%
Dairy	71	186	25	211	263	46	309	77	21	98	46%
Feedgrain	11	14		14	75	16	91	61	16	77	550%
Seeds	20	63	15	78	682	117	799	619	102	721	924%
Blended Fertilizer	10	30	20	50	290	52	342	260	32	292	584%
USG	205				693	68	761	693	68	761	
Total	740	4,419	3,572	7,991	8,379	4,858	13,237	3,960	1,286	5,246	66%

List of Reports Published by ATDP

From May 1995 through June 2000

SI No	Name of Reports	Author	Date of Published
<i>Special Reports</i>			
1.	Plan for Establishing Market Monitoring and Information System with MOA	MIS Unit	September 1995
2.	Plan for Establishing Market Monitoring and Information System with Private Sector	MIS Unit	November 1995
3.	Special Study of the Fertilizer Situation in Bangladesh: With the Emphasis of Urea	Thomas H. Foster, Team Leader and Abu Abdullah	November 1995
4.	Benchmark Survey Report	MIS Unit	December 1995
5.	Technology Needs assessment	Agribusiness Development Unit	December 1995
6.	Checklist for Fresh Produce Production and Non-Traditional Export Development Endeavors Bangladesh	Matt Tokar	January 1996
7.	Training Needs Assessment, Training Plan and Evaluation Plan	MIS Unit	March 1996
8.	Poultry Industry in Bangladesh	G.W. Albright, DVM	March 1996
9.	Evaluation of Selected Issues Affecting Fertilizer Distribution in Bangladesh	M. Abdul Aziz Kaberl Mustafa Albert G. Madsen M. Munir-uz-Zaman	April 1996
10.	Methodology of Developing Objectively Verifiable Indicators (OIVs)	MIS Unit	April 1996
11.	Report on Horticulture Production Technologies	A.K.M. Amzad Hossain PhD	May 1996
12.	Technology Transfer Module	Agribusiness Development Unit	•May 1996 •August 1996
13.	Appraisal of the Current Fertilizer Regulatory Situation; The Problems Resulting from the Lack of Implementation of the Fertilizer Regulatory System; and Short-Term and Long-Term Solutions to these Problem	David W. Rutland and Mofizul Islam with support from Ishrat Jahan and the MIS Unit and input from Munir-uz- Zaman	August 1996
14.	Impact Study of ATDP's Women Development (WID) Activities	Sharifa Khan	September 1996
15.	Project Impact Study Report	Mofizul Haque Khan	September 1996

List of Reports Published by ATDP From May 1995 through June 2000

SI No	Name of Reports	Author	Date of Published
16.	Trade Policy and Export of Some Products of Fruits and Vegetables, Agro Machinery and Poultry in Bangladesh	Dilip Kumar Roy	September 1996
17.	Fertilizer Vision	Dr AMM Shawkat Ali	September 1996
18.	Environmental Impact Study	ABM Anwar Hossain and K Fattah	September 1996
19.	Agricultural Mechanization and Machinery Production in Bangladesh	Amir U. Khan	October 1996
20.	Fertilizer Dealers Profile Survey (Volumes I and II)	Ishrat Jahan	November 1996
21.	Beneficiaries of Subsidies on Urea	Policy Unit	January 1997
22.	A Report on the Present Urea Fertilizer Distribution A Study on the Dealership System	M. Monir-uz-Zaman Mafizul Islam	February 1997
23.	Scenarios for Pricing Urea and DAP to Promote Balanced Use of Fertilizer	Policy Unit	April 1997
24.	Bangladesh Marketing Mission and Refresher Training for the Export of Fresh Fruit and Vegetables	G.M. Tokar Postharvest Specialist	July 1997
25.	Vision Paper on the Seed Industries in Bangladesh	Lutfur Rahman	September 1997
26.	Poultry Industries in Bangladesh Part II	GW Albright, DVM	September 1997
27.	Airfreight and Horticultural Export from Bangladesh Problems and Prospects	MA Alim	October 1997
28.	Trade Policy Study of Selected Agrobased Products Produced by Bangladesh Processors	M Abudul Aziz Kaberi Mustafa	October 1997
29.	Food Drying in Bangladesh	GM Tokar	February 1998
30.	Agricultural Mechanization and Machinery Production in Bangladesh	Amir U Khan, Agrimachinery Consultant	March 1998
31.	Report on The Soybean: Its Status, and Potential for Bangladesh	Dr John M Woodruff Expatriate Consultant	May 1998
32.	Case Study on use in Three Villages of Tangail	Dr Syed Anwarul Haque	May 1998
33.	A Study on the Prospects of Mandarin Cultivation in Sylhet and Panchagar District	M Shahidul Islam,	July 1998
34.	Environmental Impact Study	ABM Anwar Hossain	July 1998

List of Reports Published by ATDP From May 1995 through June 2000

SI No	Name of Reports	Author	Date of Published
35.	Special Impact Study Report	Ishrat Jahan	September 1998
36.	Report on Seed Potato Production Technology by ACF Borrowers	Dr Meer Musharraf Hussain	October 1998
37.	Assessment of Flood Damage of ATDP Supported Entrepreneurs and Requirement of Rehabilitation	Sharifa Khan	November 1998
38.	Report on Seed Damage and Requirement of Additional Seed	Ishrat Jahan Sharifa Khan	November 1998
39.	Fertilizer Flood Damage Survey	MIS Unit	November 1998
40.	A Report on Findings to Support the Development of the Bangladesh Private Processed Potato Sector to Produce Frozen French Fried Potatoes, Potato Chips and Snacks and Dehydrated Potato Flakes	Mr Roy E Bosley	December 1998
41.	A Strategy for Developing the Packaging Industry in Bangladesh	Robert L Cirrito	March 1999
42.	The Report on Training of Seed Dealers to Expand and/or Upgrade their Seed Business	S A Moquit	March 1999
43.	National Urea Super Granule (USG) Program in Bangladesh 1998-99	MA Razzaque	April 1999
44.	Report on Training Program for Short Term Poultry Consultants and Poultry Business Managers	Glenn H Carpenter	April 1999
45.	End of Assignment Report Improving Cold Storage in Bangladesh	James B. Styer	July 1999
46.	Implication of the Consequences of the Uruguay Round Agreement on Agriculture and Agribusiness Development in Bangladesh	Balu L Bumb D Ian Gregory Abdur Rab M Abdullah	July 1999
47.	A Study on ACF Borrowers	Sharifa Khan	July 1999
48.	Consultant's Report on HACCP Compliance and Factory Clean-Up and Sanitation	Palmi Ingarson James P Ostergard	August 1999
49.	The Development of the Bangladesh Private Processed Potato Sector -- To Produce Frozen French Fries, Potato Chips, and Corn Chips, and the Production of the Dehydrated Potato Flakes	Roy E Bosley	September 1999

List of Reports Published by ATDP From May 1995 through June 2000

SI No	Name of Reports	Author	Date of Published
50.	Report on Development of Private Seed Business Enterprises in Bangladesh	Shurajit S Bal	September 1999
51.	Report on Blended Fertilizer Project	Adrian Fuller	October 1999
52.	Fertilizer Blending Training Manual	David W Rutland	October 1999
53.	Development of Poultry Processing Integration in Bangladesh	Tommy Gilbreath	February 2000
54.	Value Added Shrimp Processing in Bangladesh	Lee Ann D. Applewhite	February 2000
55.	Report on Hazard Analysis Critical Control Point, End Assignment	James P Ostergard	May 2000
56.	Study on Tariff and Non-Tariff Barriers Affecting Domestic Production and Export of Agrobased Products March 2000	Golam Sarwar and Sirajul Islam	June 2000
Regular Reports			
57.	Monthly Market Monitoring Report -- 53 Reprints	MIS Unit	15th of each month from March 1995 through August 1999
58.	Agribusiness Bulletin (English and Bangla Version) -- 64 Issues	MIS Unit	25th of each month from March 1995 through July 2000
59.	Annual Workshop -- 6 Workplan	MIS Unit	<ul style="list-style-type: none"> •October 1995 •August 1996 •September 1997 •June 1998 •April 1999 •April 2000
60.	Annual Report -- 4 Reports	MIS Unit	<ul style="list-style-type: none"> •September 1996 •August 1997 •September 1998 •September 1999
61.	Project Monitoring and Progress Report (Quarterly) -- 20 Reports	MIS Unit	After end of each quarter from September 1995 through July 2000
62.	Policy Census -- 5 Reports	Policy Unit	<ul style="list-style-type: none"> •September 1995 •September 1997 •September 1998 •September 1999 •March 2000

List of Reports Published by ATDP

From May 1995 through June 2000

SI No	Name of Reports	Author	Date of Published
63.	Credit Monitoring Reports •Monthly – 15 Reports •Quarterly – 12 Reports	Credit and Investment Unit	•From September 1995 through November 1996 •January 1997 through January 2000
64.	Feasibility Study Reports – 15 Reports •Custom Tillage by Power Tiller •Urea Molasses Block (UMB) •Mini Poultry Feed Production Unit •Milk Pasteurization •Dairy Farm •Poultry Farm •Urea Super Granule (USG) with one Machine •Poultry Farms (layer) •Blended Fertilizer •Urea Super Granule (USG with five machine) •French Fries and Potato Chips •Processed Selected Fruits and Vegetables Products •Agrimachinery Manufacturing Unit •Mini Dairy Plan •Broiler Farming	Credit and Investment Unit	•November •April •May •September 1996 •May 1997 •May 1997 •May 1997 •May 1997 •May 1998 •May 1998 •September 1998 •December 1998 •April 1999 •July 1999 •December 1999

List of Technologies Developed and Expanded by ATDP

Seed

Production

- * 1. Certified Seed
- ** 2. Foundation Seed
- *** 3. True Potato Seed
- ✓ 4. Tissue Culture; Rantec

Variety Development

- *** 5. Hybrid Seed

Fertilizers and Chemicals

- * 1. Urea Super Granule
- * 2. Blended Fertilizers
- *** 3. Micro-nutrients
- *** 4. Bio-fertilizer

Agrimachineries

- * 1. Power Tillers
- *** 2. Solar and Power Dryers
- ** 3. Sprayers
- * 4. Threshers
- ** 5. Shellers (corn), Power
- *** 6. Fertilizer Blenders
- * 7. USG Briquetter Machine
- ** 8. Straw Chopper
- *** 9. Reaper (power tiller mounted)
- ** 10. Hydro Tiller
- *** 11. Paddy Transplanter
- *** 12. Dual Mode Thresher
- *** 13. Seed Drill (soybean)

Note: * National program
 ✓ Company specific activity

** Pilot zone

*** Experimental

List of Technologies Developed and Expanded by ATDP

Horticulture

- ** 1. Propagation of HYV Fruits
- ** 2. Hormone Treatment
- *** 3. Growth Regulators
- ✓ 4. Floriculture/Cut-flowers; Manzoor Chowdhury/Dr Ferdosi
- ** 5. Nursery (fruit crops/agro-forestry)
- ** 6. Summer tomato
- ✓ 7. Baby Corn
- ✓ 8. Modified Packaging for Horticulture Export

Livestock

- * 1. Balanced Feeding
- * 2. Non-traditional Feed UMS, UMB
- ** 3. Fodder Production
- ✓ 4. Artificial Insemination; BRAC
- * 5. Improved Sanitation
- ** 6. Improved farm management practices with special reference to
 - Regular Vaccination
 - Proper Treatment
- * 7. Selective Breeding
- * 8. Beef Fattening
- * 9. Biosecurity

Poultry

- * 1. Rearing Exotic Breed (Broiler)
- * 2. Rearing Exotic Breed (Layer)
- * 3. Confinement and Stall Feeding
- * 4. Balanced Feeding
- * 5. Improved Parent Stock
- * 6. Improved Hatchery
- ** 7. Rearing Day-old Chick
- * 8. Improved Sanitation
- ** 9. Improved farm management with special reference to regular vaccination and proper treatment

Note: * National program
 ✓ Company specific activity

** Pilot zone

*** Experimental

List of Technologies Developed and Expanded by ATDP

Agroprocessing

- * 1. Juice
- * 2. Paste
- * 3. Slice
- ** 4. Jam
- ** 5. Jelly
- ** 6. Squash
- ** 7. Puri
- ** 8. Sauce
- ** 9. Ketchup
- *** 10. Pulp
- ** 11. Pickles
- ** 12. Marmalade
- ** 13. Morabba
- *** 14. Powder and Dust
- * 15. Pasteurization
- *** 16. Recycling of Animal Waste
- ✓ 17. Dehydration; PRAN
- ** 18. Baking
- ** 19. Potato Chips
- *** 20. French Fries
- * 21. Value Added Shrimp Processing

Packaging

- ** 1. Canning
- ✓ 2. Bottling; PRAN
- * 3. Aluminum Foiling
- * 4. Paper Packeting
- ** 5. Wooden Bucketing

Fishery

- ** 1. Hatchery
- ** 2. Improving Brood Stocks and Fry Quality
- ** 3. Fry Management Package
- ** 4. Polyculture
- ** 5. Paddy-cum-fish Culture

List of Technologies Developed and Expanded by ATDP

<i>Shrimp</i>	
**	1. Hatchery
**	2. Freshwater Shrimp Culture
	3. Marine Shrimp Culture
<i>Feed</i>	
	1. Feed Management

Note: * National program ** Pilot zone *** Experimental
✓ Company specific activity