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DELIVER PROJECT



Delivering Family Planning One Village at a Time

20 Years of Supply Chain Work in Bangladesh

August 2011

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USAID | DELIVER PROJECT, Task Order 1

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Abstract

For more than 20 years, USAID worked with John Snow, Inc., to improve the delivery of family planning supplies in Bangladesh through multiple, consecutive projects, focusing primarily on logistics, procurement, institutional strengthening, capacity building, and commodity security. This publication highlights achievements and lessons learned from 1988 to 2010.

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Acronyms

CC	commercial carrier
CPR	contraceptive prevalence rate
CWH	Central Warehouse
DGFP	Directorate General of Family Planning
FPLM	Family Planning Logistics Management project
FWA	family welfare assistant
FWC	family welfare center
FWV	family welfare visitor
GOB	Government of Bangladesh
IUD	intrauterine device
JSI	John Snow, Inc.
KfW	Kreditanstalt für Wiederaufbau
LCF	Logistics Coordination Forum
LMIS	logistics management information system
LSO	logistics support officer
MOHFW	Ministry of Health and Family Welfare
MOS	months of stock
NGO	nongovernmental organization
PLTM	permanent and long-term method
SDP	service delivery point
SMC	Social Marketing Company
UIMS	Upazila Information Management System
UNFPA	United Nations Population Fund
USAID	U.S. Agency for International Development
WIMS	Warehouse Inventory Management System



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“গণপ্রজাতন্ত্রী বাংলাদেশ সরকারের স্বাস্থ্য ও পরিবার কল্যাণ
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Store at room temperature between 15-30°C (59-86°F)

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Executive Summary

In 1988, the U.S. Agency for International Development (USAID) engaged John Snow, Inc. (JSI) to strengthen the family planning supply chain in Bangladesh. For more than 20 years, USAID and JSI, with the help of many other organizations, supported the Government of Bangladesh (GOB) in its goal to reduce the country's high fertility rate.

During 22 years, USAID funded five consecutive projects to improve the supply chain: the Family Planning Logistics Management project (FPLM) I, II, and III; the DELIVER project; and the USAID | DELIVER PROJECT. The result was a significant increase in access to family planning products for the people of Bangladesh, which increased the contraceptive prevalence rate (CPR), and lead to a reduction in the total fertility rate.

The projects focused primarily on logistics, distribution/transportation, procurement, institutional strengthening, capacity building, and commodity security. While initial efforts reduced waste and put in place basic logistics management practices, further improvements brought new technology into the warehouses and introduced innovative ideas to optimize the system.

The projects continually looked for improvements. Automation of logistics tasks and improved supervision helped the workforce become more efficient; and by restructuring the supply chain, the projects achieved significant savings by reducing the pipeline and supply chain tiers, among other things.

Many of the challenges and opportunities faced by the projects were similar to those of other developing countries. Innovations and lessons learned from the successful supply chain work in Bangladesh informed supply chain work in other countries, such as the use of PipeLine software—the predecessor was first developed in Bangladesh.

By 2010, the type of support provided by the USAID | DELIVER PROJECT had evolved considerably from that given in 1988. The GOB had taken over, or contracted out to local service providers, the key logistics functions: forecasting, estimating financing needs, procurement, storage, distribution, supportive supervision, work force development, and operation of the logistics management information system.

Despite many attempts by the project to improve and institutionalize good procurement practices within the Ministry of Health and Family Welfare (MOHFW), procurement remains the weakest part of the system. The lack of sustained progress in procurement reflected a lack of commitment at senior levels in government to address endemic problems caused by staff turnover and excessive bureaucratic delays. Without timely decisionmaking and dependable procurement processes, the pipeline of products continues to be at risk of drying up, leaving service delivery points (SDPs) without products.

The following chapters highlight JSI's work with the USAID-funded family planning projects in Bangladesh. Each tier of the supply chain is described; and, in narratives, long-time employees explain, first-hand, how their work environment changed as a result of 20 years of continuous improvement. Bangladesh has made impressive gains in family planning since 1988.



Background

For decades, Bangladesh, one of the world's poorest and most populous countries, has struggled with the negative effects of high population growth rates. Even before Bangladesh became an independent country in 1971, the region had seen governmental attempts to introduce family planning to its citizens. The results, however, were minimal due to the stresses of political turmoil and natural disasters.

A group of social and medical workers started voluntary family planning efforts in the early 1950s. In 1960, the GOB started providing clinic-based family planning services; in 1965, family planning became a national priority and a new program was launched as a strategy for economic development.

Slowly, the contraceptive prevalence rate started to rise, which helped curb the population growth. In 1976, the GOB introduced the first national population policy, integrating maternal and child health with family planning. They recruited 13,500 village-based female service providers and 4,500 supervisors from the unions (a Bangladeshi administrative division) to promote and expand the use of contraceptives; in 1981 they increased the number of service providers to 23,500.

In 1975, only 5 percent of married women used contraception; in 1989, the number had increased to 31 percent. Most of these early results came from sterilization as the method to decrease fertility. As the GOB tried to increase the availability of family planning options for its population, it became clear that women also needed access to short-term methods, such as condoms and oral contraceptives. Making this possible in a country of very limited resources was no small task; a reliable and extensive supply and distribution system needed to be built.

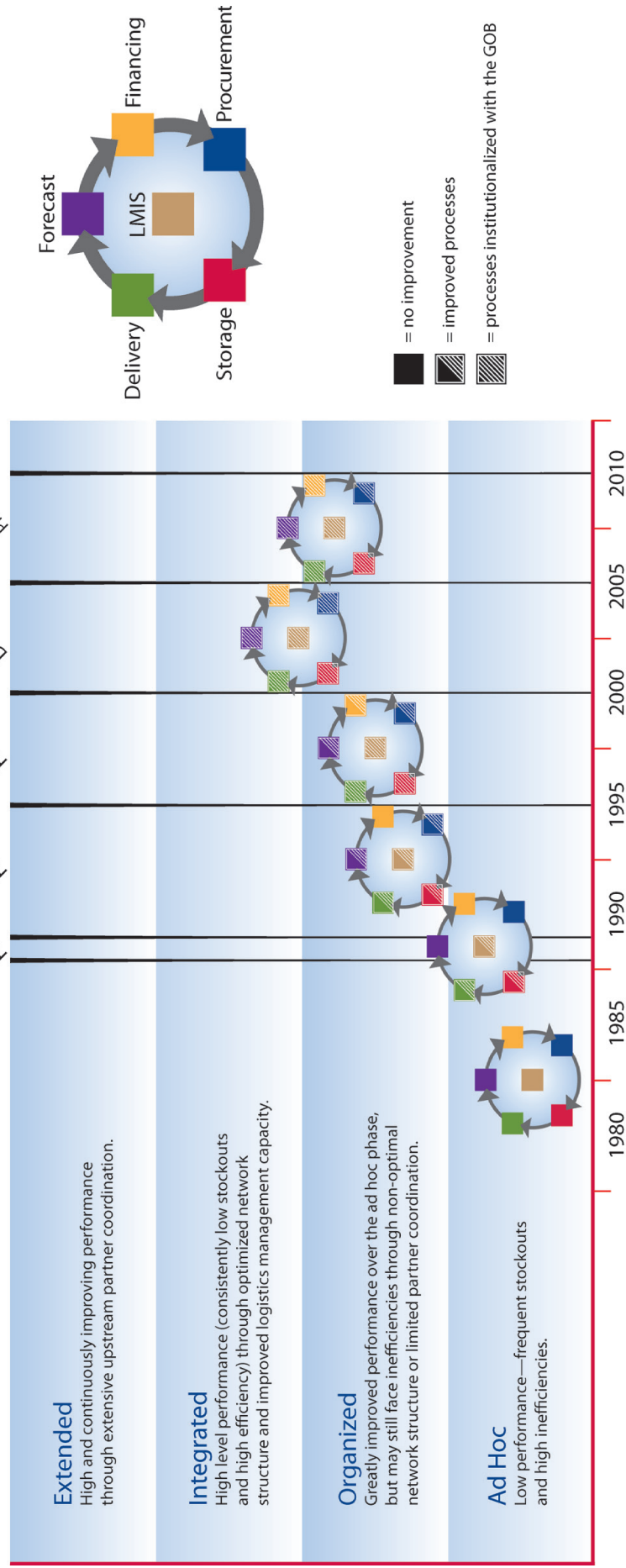
In response to this need for additional family planning options, USAID began providing support to the GOB; in November 1988, the USAID-funded Family Planning Logistics Management (FPLM) project was launched in Bangladesh. This project became the first of five successive multi-year endeavors to support the GOB in its quest to ease population growth and improve the lives of countless women and their families.

For more than 20 years, from 1988–2010, these logistics strengthening projects were carried out by JSI, with the help of many partners and collaborators. This publication highlights some of our achievements during more than 20 years of working to improve family planning in Bangladesh.

Twenty Years of Family Planning Supply Chain Management in Bangladesh

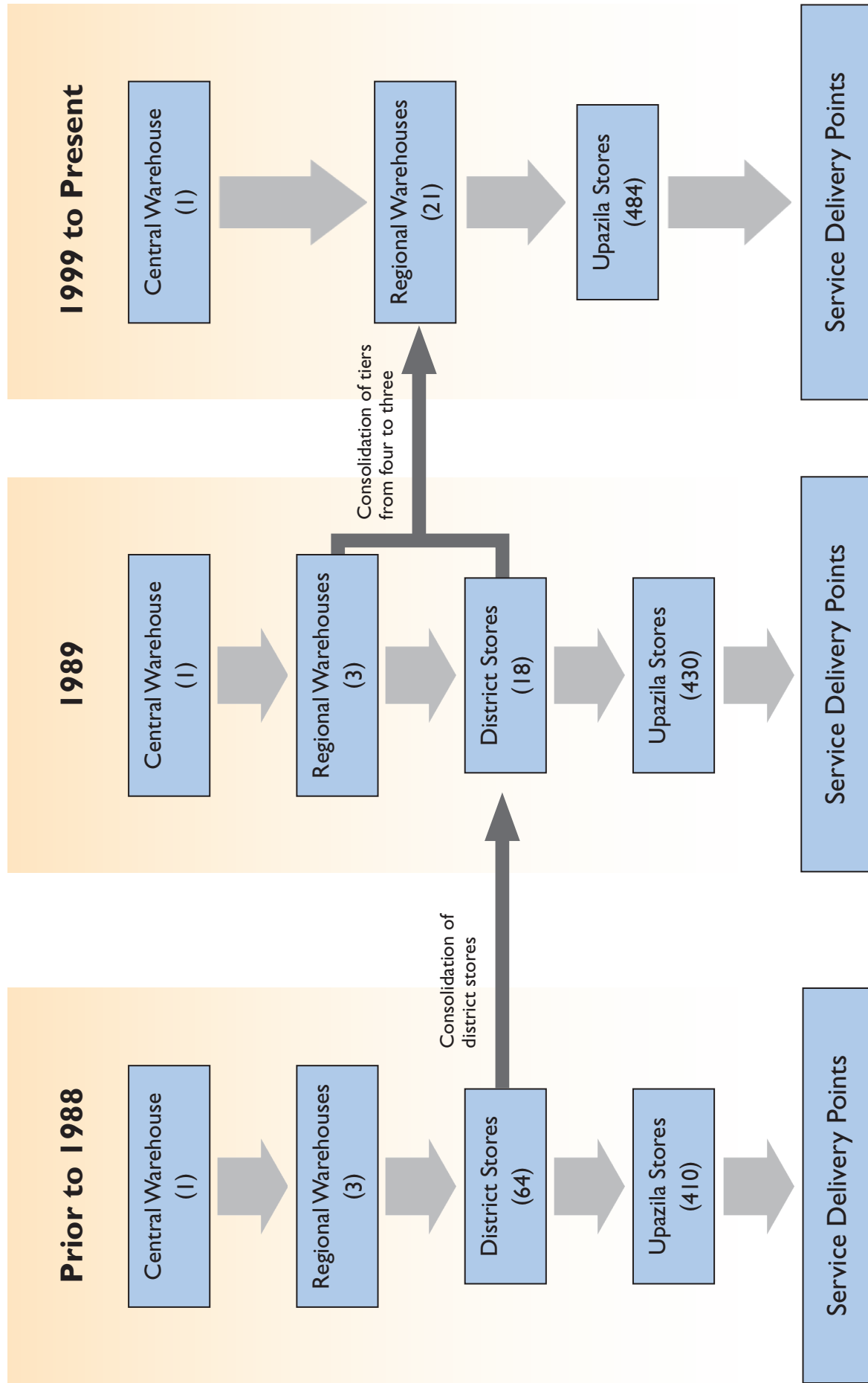
Through consecutive USAID-supported projects, the contraceptive supply chain in Bangladesh matured from an ad hoc to an organized system with elements of an integrated public health supply chain, as shown in Figure 1. The difficulties in institutionalizing the procurement function within the GOB caused a setback during the USAID | DELIVER PROJECT.

Figure 1. Supply Chain Maturity



Note: The supply chain evolution depicted in this chart refers specifically to the Bangladesh family planning program, not to the overall public health supply chain.

Figure 2. The Bangladesh Family Planning Supply Chain 1988–2010





Balancing Supply and Demand

Before 2002, when all contraceptives came from donors, fluctuations in product availability tended to be smaller. As donors had more flexibility to provide products, the procurement cycle varied by product, but it was typically shorter before 2002. After 2002, initial GOB procurements were successful, but for each product, stock fell below the minimum level before a second procurement took place, resulting in a longer and more pronounced bull whip effect (the rise and fall of the stock level with each procurement) after 2002.

The nationwide stockouts seem to be associated with months of stock (MOS) falling below five months. After 2002, stock levels were slightly more likely to fall below the minimum—12 times in 13 years and three nationwide stockouts since 2002. Prior to 2002, the stock levels fell 10 times in eight years, with two nationwide stockouts, both related to injectables.

Stock Levels of Directorate General of Family Planning Contraceptives in Bangladesh

Figure 3.

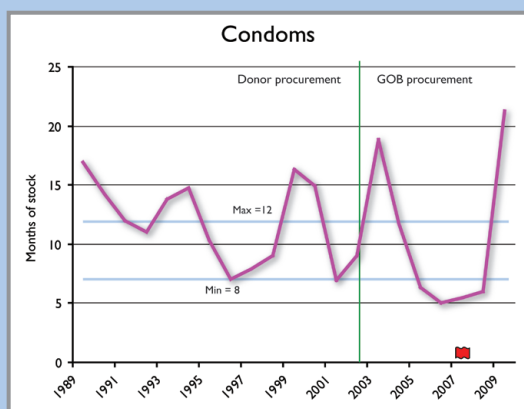


Figure 4.

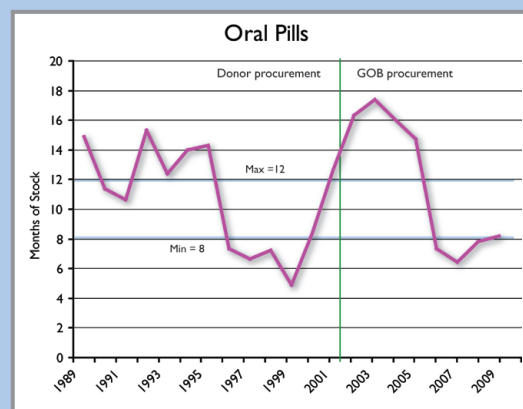


Figure 5.

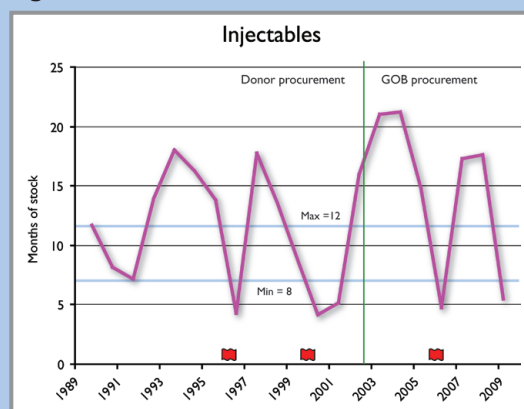
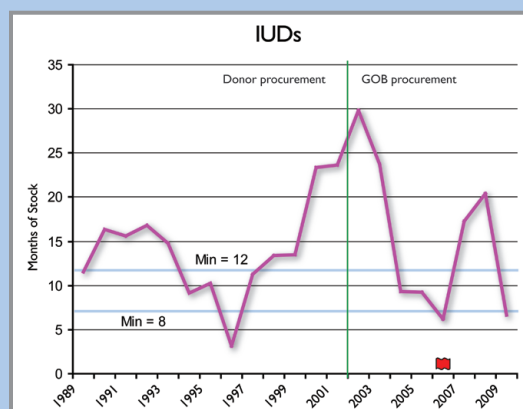


Figure 6.



Note 1: The months of stock (MOS) shown in the charts represent the national average for all four levels in the system (CWH, regional warehouses, upazila stores, and service delivery points). The four levels have minimum and maximum stock levels of two and three MOS, respectively, making the total national minimum and maximum levels 8 and 12 MOS.

Note 2: Prior to 2002, donors donated all contraceptives. In fiscal year 2002, the GOB began using World Bank loans to procure contraceptives. The USAID | DELIVER PROJECT trained government desk officers to procure commodities following government and World Bank procurement policies and procedures. Since then, the Logistics & Supply (L&S) unit has procured family planning and reproductive health commodities.

Source: Pipeline Reports and the DGFP LMIS.

 Signifies nationwide stockouts



What Does It Take to Get a Condom to Bangladesh?

With seemingly little effort, a box of condoms arrives at the family welfare center (FWC) in Kalikapur union, one of the southernmost areas of Bangladesh. What is not seen is the enormous effort it has taken to deliver the condoms.

When a condom is shipped to Bangladesh, it moves through the country's four-tier supply chain, (1) from the port of entry to the Central Warehouse, (2) through the regional warehouse, (3) to the upazila (subdistrict) store, and (4) then to an FWC or family welfare assistant (FWA), where the consumer receives it.

Although commodities travel in just one direction, the supply chain is a cyclical, not a linear, process. Without data from service delivery points and feedback from warehouses, decisionmakers would not know what to order and where to send it, and the system would quickly come to a halt.

Logistics data, including consumption data, from all tiers of the system, feed into annual quantification exercises, which power funding coordination and procurement decisions at the Ministry of Health and Family Welfare (MOHFW)—the engine that ultimately drives the supply chain.

The Central Warehouse—Dhaka

A new shipment of condoms arrives at the Central Warehouse, located in a crowded suburb of Dhaka. All of Bangladesh's contraceptive shipments pass through here. Like this shipment, which came from a manufacturer in South Korea, most arrive by ship through the port of Chittagong and are then transported 250 kilometers by train or truck to Dhaka.

At the warehouse, loaders, operating modern forklifts, move the boxes into neat rows on the racks. The placement of products is carefully recorded so the storekeeper, Shah Kibria Omar, knows which products expire first, and he can follow the best practice of first-to-expire, first-out. Omar presides over the incoming delivery, checking that goods received match the order that was placed. Meanwhile, office personnel enter the condom cases into the computerized Warehouse Inventory Management System (WIMS)—recordkeeping essential to tracking the condoms through to their next destination.

Every day, the chief of the Central Warehouse, Saiful Islam, and his staff log on to the web-based logistics management information system (LMIS) to determine what supplies are needed at the 21 regional warehouses. With his team of skilled logistics personnel, Islam prepares route plans for transportation and coordinates between the government fleet and the private transport agency, each of which provide about 50 percent of the transportation needs. Goods are sent as far as Dinajpur in the north and Sylhet in the east.



With training and improvements in the logistics management system, personnel now have the skills and knowledge to carry out their work.

Despite the occasional power outage, the work environment is far better than it was 20 years ago. Then, there were no forklifts; loaders carried the heavy boxes of condoms on their heads. Islam recalls how they worked in a makeshift room, insufficient for storing commodities. “There was no store at all; there was no warehousing equipment or skilled manpower, and no proper recording and reporting system...There was no supply plan for supplying contraceptives.”

No job descriptions and a lack of accountability frequently led to the expiry of commodities, making them unusable. With training and improvements in the logistics management system, personnel now have the skills and knowledge to carry out their work.

“Nowadays,” Islam says, “The computers, the software, machineries, and equipment have replaced many manually done tasks, and saved energy and time, and added speed to our day-to-day work.”

The Regional Warehouse— Patuakhali

Shahjahan Mia, who has worked with the family planning program since 1980, is the storekeeper at the regional warehouse in Patuakhali. His office has all the modern means of communication, including a computer, Internet, and telephone. Mia has just received a routine resupply of condoms from the Central Warehouse and he is busy updating the WIMS.

The Patuakhali warehouse supplies all the upazila stores in the region; Mia reviews the upazila reports to see if a push supply should be sent out to restock any of the stores. Each month, the upazila stores send their paper-based logistics reports to one of the 21 regional warehouses; the report summarizes consumption data from all the lower tiers of the supply chain. As regional warehouse staff enter the data into the LMIS, Central Warehouse and MOHFW staff can view it on the web-based LMIS, enabling them to order the correct amount of condoms from the manufacturer.

Outside the warehouse a truck is pulling up to the loading dock. Helpers begin moving boxes of condoms and other health commodities, destined for the upazila store in Patuakhali Sadar. A supply officer makes sure the commodities are properly checked out before the driver leaves.

When Mia started working at the warehouse, there was no automation, no systematic management, and no good tracking systems or reporting tools. “Management was complicated and access to senior [staff] was not easy,” says Mia. “Now I am working with computer software WIMS and web-based LMIS, which is more efficient and effective than previous. This software reduced my workload. But overall responsibilities and accountabilities have increased.”

Better communications systems have improved monitoring significantly, making a positive impact on the program. With better management, the program has been able to keep up with the increased demand for family planning products from communities and clients. Mia adds, “Through the



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The Upazila Store—Patuakhali Sadar

At the Patuakhali Sadar upazila store, one of 483 such stores in Bangladesh, Piara Begum is putting the finishing touches on her monthly logistics report for the regional warehouse. She is expecting a delivery truck with a fresh supply of condoms at any minute.

Condoms and other health commodities arrive at the upazila store each month but the facility is more than a warehouse. Begum, one of several family planning officers at Sadar, is responsible for managing the family planning program in her upazila and coordinating the distribution of contraceptives.

She and her colleagues monitor and supervise program activities at the subdistrict’s FWCs. They bring workers together for orientation and planning meetings. They also travel to the villages to provide on-the-job training to FWAs, who distribute contraceptives door-to-door.

The work environment has steadily improved during the past 20 years—everyone is working more systematically now. Staff are well-trained, they know their jobs, and they know how to achieve their goals. “Easy communication systems have brought significant changes in the monitoring systems, which improve the program activities a lot,” says Begum. “Automation in logistics management has reduced the workload of the staff, and created an opportunity for easy tracking of logistics issues. Overall, program management has improved in all respects.”

The Family Welfare Center—Rasulpur

From early in the morning, the FWC in the village of Rasulpur is buzzing with activity. Villagers are filling the waiting room, hoping to see one of the center’s family welfare visitors (FWVs)—trained female paramedics, who provide basic health services for the community. It is here, at the service delivery point, where the true meaning of “No Product, No Program” is most aptly demonstrated—if providers do not have a full range of products available, clients leave empty-handed and the family planning program does not succeed.

Ayesha Begum has been a family welfare visitor since 1982, counseling villagers about birth control methods and providing routine checkups for pregnant women. She has witnessed the changes in Bangladesh’s family planning program firsthand. “Twenty years ago,” she explains, “the workload was smaller, but more time was spent on counseling and motivating people to use contraceptives.” Family planning was not well received by clerics and local



“Easy communication systems have brought significant changes in the monitoring systems...”



“The program now has a steadier supply of contraceptives...”

communities; clients were seldom aware of their right to get service from the clinic. FWVs spent much of their time educating people about the benefits of using contraceptives.

Recording and reporting tools were not standardized, and the supply of medicine and contraceptives was inadequate. Today, attitudes have changed, and better logistics management is in place to ensure that products are available. The program now has a steadier supply of contraceptives and, with family planning as an accepted practice, is able to distribute them. The increase in the contraceptive prevalence rate (CPR) proves it.

“It means my service played a role in keeping the family size small in my country,” says Begum. “Always, small and planned families enjoy better health, nutrition, education, etc. A community with good health and planned families can play a vital role in a nation’s economy.”



Improvements in the supply chain opened the door for new products and adequate supply.

In the Community—Kalikapur Union

In a small village in Kalikapur union, Khaleda Khanam, an FWA, is visiting a local household. All the females living nearby have come to listen. Khanam holds up a condom as she talks to the women about family planning methods. The women are all of reproductive age and eager to know what choices are available.

Before the visit is over, Khanam has distributed condoms and oral contraceptives, and administered an injection of Depo-Provera, which prevents pregnancy for three months. She carefully updates her register of couples using contraceptives; then she notes any pregnancies among the women, so she can refer them to the FWC for better care.

Khanam, who has made her rounds since 1977, is one of 23,500 FWAs providing year-round door-to-door family planning services in Bangladesh. When the program began, availability of short-term methods was very limited, and sterilization was sometimes the only option. Khanam recalls, “It was difficult to visit the field. People did not accept me easily. Clients did not want to hear about family planning.” Local political leaders were not supportive of the program, and sometimes family planning workers were even attacked.

Logistics and communications were cumbersome. Family planning inspectors, who supervise FWAs, had to collect contraceptives from a far-away warehouse, and it was very hard to reach FWAs working in the field. There was no system for recording information, making it difficult to monitor the work.

Improvements in the supply chain opened the door for new products and adequate supply. Today, with a variety of methods to choose from, including condoms, injectables, oral pills, and intrauterine devices (IUDs), couples readily accept family planning and community leaders support the program. The wide acceptance of family planning has increased CPR.

Lessons Learned

What Made the Family Planning Program Work in Bangladesh?

Understand “No Product, No Program”

A family planning program cannot succeed without contraceptive supplies. Securing funds for products and services and carrying out a good contraceptive security strategy depends on many factors:

- The government and development partners need to collaborate; this will ensure adequate funding for supplies and supply chain operations, especially by supporting donor coordination efforts like the Logistics Coordination Forum (LCF).
- The government needs to be encouraged to include contraceptives and other reproductive health commodities in its budget.
- The government, nongovernmental organizations (NGOs), and the private and social marketing sectors need to coordinate among themselves.
- The government and partners need to make a commitment to carry out agreed-upon activities and to make timely decisions.

Create an Information Culture

A robust supply chain relies on accurate and timely data. An information culture fosters the collection of information and ensures better decisionmaking at all levels. It requires—

- reliable forecasting of contraceptive needs
- use of data in decisionmaking
- a well-functioning LMIS and efficient service delivery networks
- analytical support in procurement and supply chain areas.

Put the Customer First

Family planning programs will only work if services and products are appropriate for the customers. Good customer service includes the following:

- The program must provide a variety of methods to accommodate families at the various stages of their reproductive lives.
- Emphasis must be placed on community involvement and a strong information, education, and communication program.

Use a Systems Approach

It is essential to continuously analyze the supply chain system and improve the processes; programs can obtain the best results when they do the following:

- Work with partners to correctly diagnose problems and determine the best way to improve the efficiency and effectiveness of the program.
- Develop the needed tools, standard operating procedures and practices, and follow the approach “write what is needed to be done and do what is written.”
- Continue to introduce, in phases, appropriate innovative technologies—web-based technologies, computerization of inventory management, and bar coding—to improve supply chain efficiency.

Figure 7.
Contraceptive Prevalence Rate (percentage)

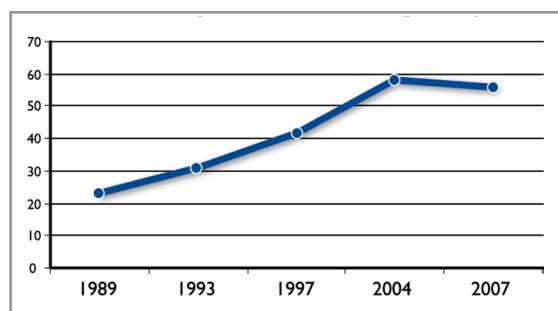


Figure 8.
Total Fertility Rate

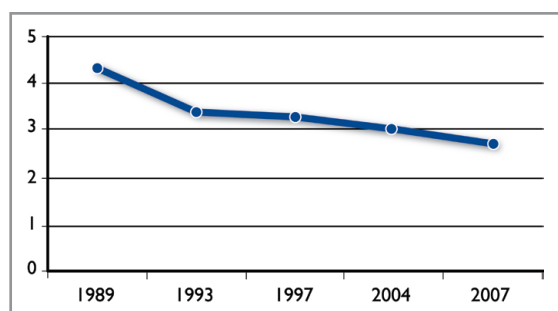
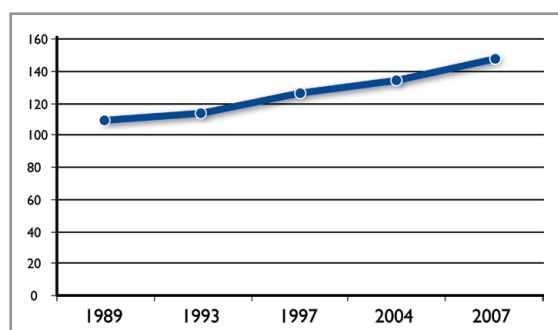


Figure 9.
Population (millions)



Source: Bangladesh Demographic and Health Survey, 2007.

Focus on the People Who Make It Work

Supply chains are only as good as the people who run them. A well-functioning supply chain system relies on support from many sources:

- Ensure dedicated support is provided for institutional strengthening and capacity building for public-sector procurement; this creates a skilled and specialized team of people to implement appropriate, coordinated procurement practices.
- Train and maintain skilled staff at every level of the supply chain, and continue to support and strengthen monitoring and supervision capabilities in the logistics system.
- Use private sector sources to support forecasting, monitoring, supervision, and training, as this has proven to be cost effective and should be continued whenever possible.
- Continue support for the existing network of field-based staff for problem solving and for providing on-the-job training and technical assistance to address field needs.
- Train and support young professionals in donor agencies, the GOB, NGOs, and the private sector to function as champions for logistics and commodity security.

Make the Program Sustainable

In the long term, ownership of a program by a country's ministry is critical for supply chain management components of family planning programs. To achieve sustainability, a program must do the following:

- Create a sustainability concept by planning jointly with host country counterparts in the design phase of a program.
- Plan training and technical assistance, collaboratively, with a high level of participation from the ministry; in phases, with a realistic timeframe, so the ministry can take over program components and, ultimately, the entire program.
- Partner with local schools and colleges to build logistics training into existing curricula for public health and population programs, thereby increasing the capacity of the supply chain work force indefinitely.

The Family Planning Logistics Management Projects, 1988–2000: Building a Foundation for Service Delivery

When USAID's FPLM project started in 1986, it did not include funding for extensive training and logistics management assistance for Bangladesh. However, in September 1988, with support from the USAID mission in Dhaka, FPLM set up an office in Dhaka and began logistics assistance.

Any effort put into improving the logistics system would pay for itself through decreased losses.

The project got off the ground with a small staff of fewer than 10 people; it was immediately faced with a multitude of system-wide problems in a severely resource-constrained environment. In addition to pervasive supply chain problems, the local populations were not in favor of contraception. This made delivery of family planning services an enormous challenge.

Based on a country-wide assessment, the project team started, simultaneously, to improve many of the logistics system's fundamental areas: they modified and expanded data collection and reporting, introduced inventory control, began training logistics staff, and started designing a better LMIS. Many of the project's stakeholders, including policymakers and government officials, did not have a depth of knowledge or understanding of logistics, and it fell on the project to gain their trust and support.

Only with accurate and timely data from all levels of the logistics system would the project be able to accurately forecast contraceptive needs and prevent stockouts at SDPs. Gathering the data was critical; it had to be collected regularly from 5,000 FWCs and SDPs, and from 23,500 community health

workers (called FWAs) going door-to-door to distribute contraceptives directly to families in villages and towns. It was, by any measure, a vast amount of data to funnel from the lowest levels of the supply chain up through the five tiers of the supply chain system.

Initially, the project focused on gathering the data and making sure it was correct. For each product in the logistics system, the project

State of the Supply Chain

Consultants working in Bangladesh in the late 1970s and early 1980s reported the following observations on the logistics management system:

- Reporting forms were out of stock.
- More than half the upazilas and districts did not submit reports.
- The reporting rate was less than 30 percent.
- An inventory control system was not in place.
- Submitted data were not analyzed.
- cursory examination by consultants showed gross errors in submitted data.
- Managerial reports were not generated.
- Data entry and analysis posts remained unfilled.
- Warehouses and stores were overcrowded.
- Storage facilities had unusable commodities awaiting disposal because cumbersome procedures made disposal difficult.
- Distribution of contraceptives lacked any quantitative basis.
- Both stockouts and expired stock were common occurrences.

Each year, millions of dollars worth of contraceptives were lost, wasted, or stolen during transport from the manufacturer to the consumer. Any effort put into improving the logistics system would pay for itself through decreased losses.



designed new data collection and distribution forms to capture information on stock on hand, stock received, stock issued and dispensed to users, and adjustments to stock. The first week of every month, field workers came to the upazila headquarters to submit their reports. After reviewing the progress and stock balance, the family planning officer and the storekeeper replenished the supplies for each field worker.

The country's 483 upazila stores aggregated the reports and sent them to the next level in the supply chain: the regional warehouses. From there, data was distilled into management reports and sent to the DGFP, within the MOHFW. At the ministry, the reporting data became the basis for forecasting how much supply they should procure.

Computerizing the regional warehouse inventory systems in 1994 became a turning point in the effort to improve data quality. With better data, managers were able to improve planning and forecasting decisions, apply accountability, and identify problems in the chain. Building a standardized recording and reporting system for an entire country from the ground up was an enormous effort; not until 1998 did data from all levels, including warehouses, stores, clinics, and field workers, make its way into the LMIS.

After the project was launched, a new LMIS database replaced the original spreadsheet-based system, giving the project new tools to track stock movements and inventories. Improvements in the LMIS gave project staff a quantifiable basis to plan storeroom construction, determine project method mix, estimate transport requirements,

develop quality assurance protocols, institute local procurement procedures, assess training activities, and gather feedback. Graphs generated from LMIS data enabled policymakers and donors to easily see how improvements in the logistics system affected the availability of products. The database-driven LMIS was a powerful tool for forecasting and procurement, worthy of further investment.

The Bangladesh logistics system started out delivering only contraceptives. As the system matured and people recognized its effectiveness, the product scope was broadened. From the early 1990s, the supply chain started delivering drugs and dietary supplement kits, consisting of 26 essential drugs for the treatment of pregnant and lactating mothers, and children under the age of five.

The project also collected logistics data from NGOs and the Social Marketing Company (SMC), a privately managed not-for-profit organization, even though the government did not exclusively supply the SMC. By accessing data from multiple sources, decisionmakers would have a broader perspective of family planning problems and needs, which facilitated national-level forecasting and program monitoring. The DGFP supplied the USAID-funded NGOs with family planning supplies; and the project provided logistics support to them, particularly through the logistics support officers (LSOs), who were introduced in 1993.

LSOs were based at warehouses and stores throughout the country to ensure that supplies would make it through the last mile to the consumer. Using routine monitoring visits, they acted as facilitators and problem solvers to build capacity among the people who worked on the ground and to make sure that the system ran smoothly. They provided on-the-job training to supply officers at the regional warehouses and upazila storekeepers to correct any mistakes in warehouse management, recordkeeping, and reporting.

From the very beginning, the project made sure that inventory control registers were in place in all warehouses. The system recorded all movements of stock in and out of the facilities. From the mid-1980s to the mid 1990s, pilferage and

The Condom Gap

In 1983, the annual discrepancy between the quantities of condoms brought into the country and quantities reported as dispensed to users was valued at \$1 million. As the project improved transparency in the logistics system, pilfering and waste declined and more products reached the consumers.

system loss were often reported, but the exact percentage of loss was debatable. To verify inventory data, a joint team of project and government inspectors periodically went out to sample sites at warehouses and SDPs to conduct commodity surveys—using physical inventories to validate LMIS data. By the mid-1990s, the survey of central and regional warehouses was institutionalized with the DGFP, which conducted full semi-annual physical inventories. The results of the physical inventories also helped staff discover where monitoring and supervision and other management actions were needed.

At each tier of the logistics system, people needed guidance and education, not only to close existing gaps in skills and training, but to educate personnel as the system changed and became more advanced. Development of the staff at every level of the supply chain was critical, and, as the project got underway, training was conducted routinely at all levels.

The project designed a standardized logistics training curriculum for managers at the ministry, NGOs, and the SMC, targeting supervisors and storekeepers at all levels of the supply chain. It included basic skills, such as filling out LMIS forms and using data for operational decisionmaking. With built-in incentives, the logistics system itself encouraged reporting compliance. As monthly reports were sent to the higher levels of the supply chain, supplies and information on performance, including a list of non-reporting facilities, were sent back to the facilities at the lower levels. For the first time, health workers received feedback on their reporting and their performance compared with other facilities, letting them know that they were part of a larger system. The feedback loop encouraged participation and allowed the project to apply training where it was needed most.

Logistics tools and job aids with step-by-step instructions had been used since the inception of the FPLM project; but in 1991, the project developed a logistics procedural manual, popularly known as the Supply Manual. It was a comprehensive 200-page document, covering every procedure in the system, including all

government circulars related to family planning and reproductive health logistics. As the system improved, the manual was updated—a major revision was made in 2008.

From 1989–1995, the project operationalized 210 USAID-constructed upazila stores by providing store equipment, including cabinets and shelving. To cut costs and improve the transportation system, commercial carriers (CC) were introduced as a pilot project in 1995. Less expensive and timelier than the DGFP fleet, CC eventually transported goods to about 50 percent of the upazilas.

By 2000, the FPLM projects had made significant improvements in the Bangladesh logistics system, both in terms of system design and human resource capacity. The MOHFW produced its own LMIS and pipeline reports, enabling them to plan procurements annually. For the complex tasks of short- and long-term forecasting, the DGFP still looked to the project for technical assistance.

Forecasting efforts in Bangladesh blazed a trail for other countries. Project staff on the ground in Bangladesh developed software, specifically for the DGFP, to track commodities on their way to the consumer. This application became the foundation for PipeLine, now one of the USAID | DELIVER PROJECT's flagship applications; it is used in most of the countries where the project works.

The investment in the FPLM projects had clearly paid off, but much of the work was still to come. The project continued to grapple with the challenges of staff shortages, frequent turnover of trained staff, and bureaucracy, all of which hampered efforts to hand over key activities to the GOB.



The DELIVER Project, 2000–2006: On the Way to Sustainability

Building on the foundation of the FPLM projects, DELIVER focused on enhancing all areas of the logistics system. At this point, an important consideration was the sustainability of the program. What would population growth and contraceptive usage look like five and 10 years into the future? And, would the country be able to continue providing contraceptive security for its citizens at the level established by the FPLM projects?

At the outset of the DELIVER project, the use of permanent and long-term methods (PLTM) among Bangladeshis had decreased significantly as products for short-term methods, such as condoms and oral contraceptives, had become more readily available. By 2015, if the CPR continued to rise as expected (from 43 to 70 percent by 2015), Bangladesh and its international donors would be faced with a U.S.\$70 million annual product demand from more than 27 million eligible couples. To head off a potential shortfall and move toward a sustainable situation, the GOB and its partners needed to find ways to balance the demand for product with the available funding. As a result, the project started a new initiative to encourage policymakers to focus on contraceptive security, a concept—unknown at the time—that went on to be used all over the world.

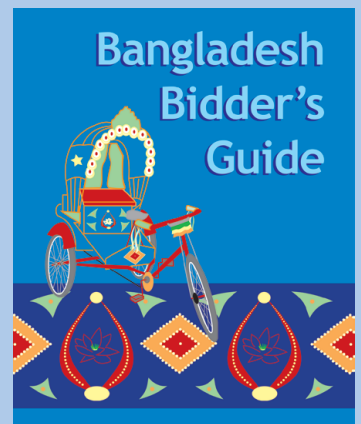
To create strategies for increasing the efficiency and sustainability of contraceptive distribution, the project wrote the white paper, *A Consequence of Success: The Issue of Contraceptive Security in Bangladesh*. At a symposium in June 2002, they brought together MOHFW staff with health care providers, policymakers, donor representatives, and international experts. The discussions focused on 20 strategies that would promote the use of PLTMs, expand the use of private sector distribution of contraceptives for those able to pay, and increase the cost efficiency of the supply chain by reducing tiers and lowering prices using large-volume, long-term purchases.

Despite efforts to coordinate procurements, persistent delays within the DGFP threatened the family planning program, sometimes leading to stockouts. Frequent staff turnover within the ministry and a preference to promote local manufacturers prevented products from reaching the hands of consumers, although adequate funds from international donors were available. However, using these funds required strict adherence to World Bank procurement guidelines, something the GOB did not have the capacity to do.

First-of-a-Kind Manuals Help Government of Bangladesh Procure Contraceptives

When the GOB set out to manage a five-year, \$1.8 billion World Bank–funded procurement of contraceptives, they were in uncharted territory. Previously, donors had completely managed this complex process. To help the GOB become more independent in procuring commodities, the DELIVER project published three

first-of-a-kind procurement manuals. Written in simple, easy-to-understand language, with many illustrations, the *Procurement Primer for Health and Family Planning Programs in Bangladesh* was produced for government officials; while the *Bangladesh Bidder's Guide* was for suppliers bidding on government contracts. A reference manual provided key World Bank and GOB procurement documents. The manuals are still being used today.





In 2002, through its subcontractor, PATH, the project set out to strengthen the DGFP's procurement capacity and to align Bangladeshi practices with World Bank standards for transparent procurement; this would enable the GOB to conduct an independent World Bank procurement. During the next two years, consultants provided day-to-day expertise to change procurement regulations to meet World Bank conditions. They guided desk officers through the complicated and lengthy procurement procedures, and trained ministry staff in procurement processes that met international standards—managing bidding documents, contract management, pre-shipment inspection, and coordination with the World Bank. The project created procurement plans, handbooks, videos, and other tools to help institutionalize the knowledge and experience gained in the ensuing procurement. It was a very complex undertaking that involved several square meters of paperwork.

With lower prices, forecasts of Bangladesh's funding needs for 2015 were reduced from \$70 million, estimated in 2000 prices, to \$53 million for the same volume of commodities.

By the end of 2003, the GOB had procured 446 million condoms, 50 million cycles of contraceptive pills, and 31 million doses of injectable contraceptives: the threat of

contraceptive stockouts receded. It was well worth the wait. The winning bid for pills and condoms from an Indian company realized a cost savings of more than \$17 million and lowered the forecast of funding needs, considerably improving Bangladesh's contraceptive security.

With lower prices, forecasts of Bangladesh's funding needs for 2015 were reduced from \$70 million, estimated in 2000 prices, to \$53 million for the same volume of commodities. In 2004, to recognize this savings, the Ministry of Finance, for the first time, approved \$690,000 to fund contraceptives from the government's own revenue budget.

By creating the LCF, the DELIVER project played a leading role in preventing stockouts of contraceptives stemming from procurement issues. In periodic meetings, the MOHFW and development partners, including the World Bank, the United Nations Population Fund (UNFPA), the Canadian International Development Agency, Kreditanstalt für Wiederaufbau (KfW), and USAID coordinated activities, reviewed stock status, identified supply chain bottlenecks, and resolved problems before they became emergencies. DELIVER's support contributed to reducing procurement lead time substantially, by almost one-third. However, collaboration from the DGFP was not always consistent; only with great effort was the project able to bring ministry officials back to the table, after the forum had a break for several years. Nevertheless, the LCF played a significant role in ensuring policy-level commitment for contraceptive security.

The project was continually looking for ways to make the logistics system more agile, reduce loss, and lower cost. Technical assistance had helped strengthen the five-tier distribution system and establish inventory levels to prevent stockouts. But, a larger opportunity presented itself: reducing the distribution tiers from five to four, and the minimum and maximum MOS from 12/16 to 8/12 MOS. This would mean an immediate cost savings of \$5 million by reducing the amount of inventory needed in the pipeline. There would also be recurrent

savings from managing fewer supplies. From 2004–2005, as part of a broader effort to improve contraceptive security long-term, the project implemented this rationalization of distribution tiers, greatly improving the efficiency of the system.

Establishing good warehousing and distribution practices was essential to reducing loss. The project designed new and more efficient layouts for the stores and helped them dispose of damaged, expired, and obsolete commodities, releasing at least one-third of the space at most stores. In 2004–2005, the project implemented a computerized WIMS, providing computers, software, printer, and Internet connections to the Central Warehouse and all 21 regional warehouses. With the new equipment, warehouse staff could transfer data and communicate effectively by using email for the first time.

The project established monthly shipments to all levels, based on a push system of supply, and rationalized the catchment areas of regional warehouses, making it easier for upazila stores to receive supplies from regional warehouses. Integrated LMIS reporting for the upazilas reduced paperwork, saving time and money. All these efforts helped make the logistics system more effective and efficient.

The DELIVER project focused mainly on reforming the supply chain, but a few initiatives targeted the increased use of PLTMs. The project produced medical and surgical requisites kits, providing all drugs and equipment to perform procedures for long-term methods. They also worked with EngenderHealth to promote PLTM services and made efforts to get more of the resources to the poorest part of the population by analyzing market segmentation and reaching out to the public and private sector, SMC, and NGOs to change behaviors.

Capacity building was essential to the success of the project. A logistics system could only be run effectively if its staff had the knowledge, tools, and skills to do their jobs. DELIVER training and technical assistance extended to all levels of the supply chain, including the DGFP,

the Central Warehouse, regional and upazila storage facilities, SDPs, the SMC, and NGOs working in health and family planning.

To build sustainable training mechanisms, the project worked with the National Institute of Population Research and Training, DGFP's training organization, to include logistics in pre-service and in-service training curricula for government employees. Logistics training was also built into the curriculum at the Institute for Pharmacology; and, to multiply the effects of the project's technical expertise, training-of-trainers was used widely, especially for NGOs.

NGOs played a significant role in the family planning sector, serving a relatively small percentage of the population; but, in many cases, they provided services to those who could not be reached by public sector services. With the project's help, the NGOs received supplies directly from the upazila stores, and monitoring by the LSOs helped maintain a regular contraceptive supply.

Making Contraceptive Security Sustainable

In the late 1970s and early 1980s, sterilization (both male and female) was the most prevalent method of contraception in Bangladesh. This trend, however, started to reverse in the 1990s. Short-term methods, such as oral pills and injectables, gradually became the most popular methods, increasing to 69 percent of the contraceptive prevalence rate (CPR) in 2004, with permanent and long-term methods (PLTMs) falling to only 12 percent of the CPR. This increase in resupply methods significantly increased the public-sector cost of contraceptive procurement.

Based on the recommendations from the 2002 contraceptive security conference to increase the share of PLTMs and reduce dependence on short-term resupply methods, the DGFP—with technical support from EngenderHealth and DELIVER—took action in the field to motivate clients to accept PLTMs and to provide increased access. As a result, the number of people using PLTMs increased from 2.3 million in May 2004 to 2.9 million in May 2006, a 28 percent increase over two years.



Whenever problems or disruptions occurred, the DELIVER technical staff intervened to facilitate and augment supplies. The project also developed an NGO LMIS, trained NGO staff, and provided them with job aids and support.

SMC supplied family planning products to the segment of the population that was able to pay for services. However, the flow of commodities was not always consistent with consumption. To strengthen the supply chain, the project helped SMC redesign its LMIS and facilitated the transfer of 100 million condoms from GOB-procured supplies, ensuring availability for consumers.

The LMIS had become a cornerstone of the logistics system and the project continued to provide computers, printers, accessories, and consumables for its operation. LMIS forms were fine-tuned to collect, compile, analyze, and disseminate information on SDP-level stockouts of contraceptives, which were an important indicator of the project's success in fulfilling end users' family planning needs.

...building and handing over the LMIS to the GOB was a milestone described by a USAID assessment team as an “example of successful technical assistance to the government data collection and analysis.”

With monthly reporting from the lowest levels of the supply chain, the central database was able to

provide comprehensive information for regular publication of a national logistics report, supplying important decisionmaking support to donors.

By 2006, the DGFP staff were fully operating the LMIS system, with DELIVER providing only as-needed troubleshooting of software problems. The project continued to monitor stock levels, alerting the DGFP and partners as soon as they detected a low stock or stockout situation. The results achieved in building and handing over the LMIS to the GOB was a milestone described by a USAID assessment team as an “example of successful technical assistance to the government data collection and analysis.”

The USAID | DELIVER PROJECT, 2006–2010: A Modern Supply Chain in the Making

As Internet connectivity and web applications became more widespread, around the time of the millennium, the project was looking toward eventually moving to a web-based LMIS. The benefits of a web-based system would be enormous; users of the system would be able to access data anytime, from anywhere; and, with decentralized data entry, the accuracy and timeliness of report generation and supply decisionmaking was certain to improve. A project like this would be feasible if the infrastructure to connect to the Internet was in place and if government institutions would accept the new technology.

Reporting times were cut drastically; the LMIS report went from taking two months to 20 days, the supply plan—from two months to zero.

Using a local software company, the project started to design the new web-based logistics system in 2006, the first of its kind in the world. By 2007, the system was in use at the 21 regional warehouses and the DGFP. Real-time data was now available to the MOHFW staff at the two highest levels of the supply chain, and to partners, including USAID and project staff. With this information at hand, supply decisions could be made quicker, and with a higher level of confidence, leading to increased product availability for the consumer.

At this point, only the two top tiers of the system had access to the web-based LMIS data, but data from all levels of the logistics system was captured and stored on the central server. Reporting times were cut drastically.

Instead of taking two months, the monthly LMIS report—listing stock status details throughout the month—took 20 days, while preparation time for the supply plan went from two months to zero. Follow-up actions that depended on these reports could be carried out immediately. Many more reports could be generated directly from the website; as the system evolved, new reports were developed.

Before the web-based LMIS, the management information system (MIS) unit of the DGFP had to enter 483 upazila and 21 regional warehouse reports. Now, the workload was

Computerizing the Upazila Inventories

Bangladesh's 5,000 family welfare centers and 23,500 family welfare assistants (who go door-to-door with contraceptives), rely on the country's upazila stores for their supplies. Until 2007, tracking inventory and reporting all the activity to the regional warehouse was a manual, labor-intensive task for staff at each of the 483 upazila stores. Each storekeeper had to work with 25–30 forms to report to the regional warehouse. To modernize the system, the project developed the Upazila Inventory Management System (UIMS) software. Like the Warehouse Inventory Management System, used in DGFP warehouses since 1994, the UIMS reduced reporting times and ensured accuracy in recordkeeping and reporting. It helped the storekeeper adhere to first-to-expire, first-out principles and automatically generate reports and supply plans.

The system greatly improved logistics management performance in the upazilas and now prepares them for future enrollment in the web-based LMIS; they can upload their reports and inventory directly to the central system. As of March 2010, the project had implemented the system in 125 upazila stores.



distributed to the regional warehouses, where both upazila and regional warehouse reports were entered. This eliminated the data entry bottleneck at the DGFP and resulted in shorter reporting lead times. The project institutionalized the MIS at these government facilities for sustainability; an MIS core group was formed and trained to manage the web-based LMIS, as were the staff managing data entry at the regional warehouses.

A future goal was to move toward a web-based LMIS at the upazilas, which would increase the efficiency of the supply chain. The project developed the Upazila Inventory Management System (UIMS) and started to introduce the software, which automates supply plan and report generation. The UIMS is now in operation in 125 upazilas and, eventually, all of them will be brought online.

Advances in technology, however, did not replace the need for skilled human resources. A mainstay throughout the projects, an emphasis on training and supervision played a key role in the success of the program. From the outset of the first FPLM project in 1988 until the closeout in 2010, the project trained and retrained more than 12,000 government, NGO, and SMC logistics personnel, covering every district of the country. The near 100 percent correct and timely reporting of today is the result of the project's continuous monitoring, training, and support.

The role of LSOs had been strengthened over the years. Their most important tools were the LSO handbook with monitoring checklists and

job aids. With Internet access came the LSO e-forum, where LSOs could share experiences, access lessons learned, and receive guidance from the central level.

LSOs also ran a hotline that government and NGO supply chain staff could call if they had problems, such as low stock at an SDP. By accessing the web-based LMIS, LSOs could locate stock in the system and work with the upazilas and regional warehouses to transfer products from overstocked to understocked facilities, without waiting for the next reporting period.

In October 2009, management of the LSOs and their work was contracted to a local NGO, on a trial basis. LSOs were a key reason why the supply system was functioning so well, and it was important to ensure sustainability for the support they provided to DGFP warehouses and upazilas in identifying and troubleshooting problems within the supply chain. Historically weak supervision activities by the ministry were the main reason for outsourcing these activities.

Availability and retention of qualified logistics personnel was one of the biggest obstacles throughout the project. In an initiative started under DELIVER, the project continued to work closely with Dhaka University's Department of Population Sciences to incorporate contraceptive security into their Master's of Population Sciences curriculum. These graduates will likely play an important role in the field of reproductive health and family planning and be the future advocates for contraceptive security, contributing to the sustainability of family planning programs. Begun in the 2006–2007 academic year, the population studies program included a required course in contraceptive security, developed and taught by project staff; as well as an internship to engage students in real-life logistics management by exposing them to hands-on field work.

Always looking for new ways to improve the supply chain, the project investigated the use of bar coding at the Central Warehouse to see if such a technological advance was feasible and sustainable. The pilot project revealed

that the warehouse in Bangladesh was not yet ready. To gain the optimal benefits from bar coding, certain resources had to be in place, including staffing; the capacity to modify the infrastructure of the existing warehouse; and streamlining of certain procedures—all of these were possible only if the DGFP made a firm commitment.

The project developed the Upazila Inventory Management System (UIMS) and started to introduce the software, which automates supply plan and report generation. The UIMS is now in operation in 125 upazilas and, eventually, all of them will be brought online.

The volume of contraceptives needed to supply the country's growing population had predictably increased over the years. Meanwhile, space in the Central Warehouse was very limited, something the project had called attention to early on. In 2006, the SMC asked the project to help construct a modern warehousing facility outside Dhaka. The project responded by providing technical assistance to SMC in layout, drafting of architectural plans, and specifications for equipment to manage the products. SMC funded and built this central distribution facility to house all the products marketed by the SMC, with an eye to future program growth. In April 2008, after two years of preparation and construction, the new state-of-the-art facility opened its doors for business.

Logistics Support Officers: the Eyes and Ears of the Project

Azim Uddin, a logistics support officer (LSO), spends most of his time on the road; he visits health facilities to troubleshoot logistics problems with staff working in the field. LSOs are a crucial interface with the more than 30,000 grassroots workers in the last mile of the supply chain—the family welfare assistants (FWA) who deliver contraceptives, even in hard-to-reach places. Azim often makes a scheduled visit with an FWA and other logistics staff if he sees a possible error in the information from the web-based LMIS. He visits the regional warehouses and upazilas and meets with storekeepers at the service delivery point storerooms to assess whether or not staff are following proper storage guidelines. Everywhere he goes, Azim mentors and trains, checks records and reports, conducts physical inventories to determine if they corresponded, gives instructions on how to correct and prevent errors, and ensures that field staff understand the importance of their role. By targeting low-performing facilities and providing needed on-the-job training, Azim is an integral part of the logistics system. He benefits the community where he lives and works, by being a part of what makes the LMIS so robust in Bangladesh.



Conclusions

The family planning effort in Bangladesh is widely recognized as one of the world's most successful ones and a model for other countries to follow. Despite a low literacy rate, endemic poverty, religious opposition, and low status of women, the program succeeded in its quest to improve family planning. The contraceptive prevalence rate increased from 5 percent in 1975 to 55.8 percent in 2007 and the fertility rate was reduced from 6.4 to 2.7 in the four decades since Bangladesh's independence in 1971.

Bangladesh has come a long way in securing reliable family planning services for its population, but challenges lie ahead. Demand for contraceptives is growing. A 2009 estimate has the population at more than 162 million people, up from approximately 148 million in 2007. This increase in the population, combined with a reliance on short-term methods—which require constant resupply—and the uncertainties of future funding, continue to make family planning a high priority for Bangladesh and its development partners, as family planning supports the Millennium Development Goals.

Despite impressive improvements in the country's capacity to procure contraceptives and other essential health commodities, maintaining GOB staff with the right procurement experience is a persistent problem. Frequent turnover of trained staff, due to promotion, transfer, and cumbersome policies leading to delayed procurement actions, are still causing sporadic stockouts. In 2007, the program was close to running out of condoms, and only an emergency shipment averted a stockout crisis. Several such incidents prompted a 2008 bottleneck study focusing on possible actions that the GOB, USAID, and the development partners can take to address these problems.

Bangladesh is not the only country facing issues of staff retention and bureaucracy. Fact finding studies (with the aforementioned bottleneck

study) point to the creation of an independent procurement entity, free from government bureaucracy, as a possible solution. The GOB has not considered, accepted, or implemented this idea. However, Tamil Nadu state of India is using this idea, and they are reported to be doing an excellent job.

Whatever challenges the future holds, the GOB and its partners have created an information culture, driving their supply chains with accurate, timely, and complete data. They understand the importance of customer service as the highest indicator of supply chain performance, always keeping their eye on product availability at the SDP. They emphasize and support the empowerment of the people that perform all their supply chain operations; they maintain a systems approach to supply chain management that considers the policy and financing context, as well as the many people that must work together to make an extended enterprise like the family planning supply chain succeed.

Condoms in Short Supply

In the fall of 2007, the MOHFW in Bangladesh faced a severe shortage of condoms in the public sector; countrywide stockouts were very likely. A shipment was underway, but it was held up because of the supplier's last-minute changes. The project solicited help from development partners to bridge the gap; USAID came forward with a donation of 6 million condoms. Within a month, the supplies were airlifted to Bangladesh and were on their way through the supply chain to the end user.

A community-based field worker who received the condoms at the service delivery point noted, "I was relieved to see the emergency supply of condoms from USAID, as this enabled me to ensure the continuity of crucial services to my clients." This prompt action successfully averted a full-blown stockout and gave the government time to work out issues with the supplier.

The work of the MOHFW, through its longstanding partnerships—FPLM, DELIVER, and the USAID | DELIVER PROJECT—has laid a solid foundation on which to continue building world class public health logistics. Thanks to the GOB and all its partners, Bangladesh is a model for many developing nations. It has been an honor for JSI to have been a trusted partner in this important work.

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