



USAID | DELIVER PROJECT

Bangladesh: Final Report

Task Order 2 and Task Order 6



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Abstract

This final report highlights the broad range of interventions and major accomplishments from the supply chain technical assistance provided to the Government of Bangladesh (GOB) by the USAID | DELIVER PROJECT, under Task Order 2 Avian Influenza (AI) and Task Order 6 Emerging Pandemic Threats (EPT), from March 2007 to July 2011. Project support included procuring and distributing critical AI commodities to prevent, combat, and contain the spread of disease; improving warehousing conditions and practices; designing and implementing a web-based logistics management information system for AI commodities; operationalizing a rapid response system for outbreak response; and deploying type A influenza virus (H1N1) vaccine and ancillary supplies throughout the country during the influenza A pandemic. These interventions significantly strengthened the GOB's outbreak response capacity and their capacity to ensure the availability of AI supplies when and where they were needed.

Cover photo: A Bangladeshi village woman raising ducks at home. Bangladesh. 2010. Photographer: USAID | DELIVER PROJECT staff.

USAID | DELIVER PROJECT

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Acronyms

AI	avian influenza
AIPRP	Avian Influenza Preparedness and Response Project
BTCL	Bangladesh Telecommunication Company Limited
CMS	Central Medicine Store
CVO	chief veterinary officer
CWH	Central Warehouse
DD	Deputy Director
DCC	Dhaka City Corporation
DLS	Department of Livestock Services
DGHS	Directorate General of Health Services
DLO	District Livestock Office/Officer
DSK	district storekeeper
EPI	Expanded Programme on Immunization
EPT	Emerging Pandemic Threats
FAO	Food and Agriculture Organization
GOB	Government of Bangladesh
H1N1	type A influenza virus (also called swine flu)
HPAI	highly pathogenic avian influenza (also H5N1)
ICDDR, B	International Centre for Diarrheal Disease Research, Bangladesh
IEC	information, education, and communication
JSI	John Snow, Inc.
LBM	live bird market
LMIS	logistics management information system
LMS	logistics management system
LRI	Livestock Research Institute
LTO	logistics technical officer (USAID DELIVER PROJECT)
LWIMS	livestock warehouse inventory management system
MOFL	Ministry of Fisheries and Livestock
PPE	personal protective equipment

SSCAIB	Strengthening Support Services for Combating Avian Influenza in Bangladesh
STOP AI	Stamp Out Avian Influenza
TAPP	Technical Assistance Project Proforma
UNICEF	United Nations International Children Fund
USAID	U.S. Agency for International Development
ULO	upazila livestock office/officer
WHO	World Health Organization

Executive Summary

In the face of dramatic economic loss, unemployment, and impending human health risks from highly pathogenic avian influenza (H5N1), the Government of Bangladesh (GOB) asked their development partners and the international community to help them with financial and technical assistance to prevent, combat, and contain the disease. The U.S. Agency for International Development (USAID) responded promptly and started work through its partner organizations, including the USAID | DELIVER PROJECT. The project's expertise is well known in public health supply chain management. Beginning in March 2007, at the request of the USAID Mission and working with the Government of Bangladesh (GOB) Ministry of Fisheries and Livestock (MOFL), the project provided technical assistance that measurably improved the animal health supply chain.

Based on an initial assessment, the project helped design an up-to-date logistics management system (LMS) to ensure availability of outbreak response supplies in the event of a critical outbreak. Key interventions and accomplishments by the project included—

- On behalf of USAID, provided 28,500 personal protective equipment (PPE) kits; 23,980 kilograms of Virkon[®] S disinfectant; 42 power sprayers (Karcher brand); 10,000 liters of detergent; and 100 decontamination kits. Other items included rapid antigen test kits and laboratory equipment, for a total value of U.S. \$1,541,913¹.
- First designed and implemented a paper-based logistics management information system (LMIS) which was then developed into a web-based LMIS for avian influenza and other animal health commodities. This improved supply chain visibility and capacity to support a rapid response.
- To roll out the new streamlined logistics system, provided initial and refresher training, supportive supervision, and additional on-the-job training to 1,077 staff throughout the system; and provided technical support and guidance to maintain the new web-based reporting system.
- Supported critical warehouse management improvements at the central and district levels, thereby reducing loss due to expiry and damage; and successfully advocated for dedicated storeroom staff at all levels.
- By special request from USAID, provided a special advisory role to Strengthening Support Services for Combating Avian Influenza in Bangladesh (SSCIAB), which ensured technically appropriate execution of Technical Assistance Project Proforma (TAPP) supply chain activities.
- Served as a coordination and communication point of contact for all USAID avian influenza (AI) partners, convening and facilitating meetings on behalf of USAID.
- Managed the rapid deployment of 2.5 million doses of type A influenza virus vaccine (H1N1) and associated ancillary supplies (more than 2.6 million syringes and 30,200 safety boxes), including distribution down to lowest level health facilities throughout Bangladesh. This

¹ All dollar amounts in this document are U.S. dollars.

supported the World Health Organization (WHO)-led global response to the 2009 H1N1 pandemic influenza outbreak.

From March 2007 to January 2011, these activities were core-funded under the USAID | DELIVER PROJECT, Task Order 2 Avian Influenza. In February 2011, the project continued avian influenza (AI) and outbreak response activities with limited funding under a new contract, Task Order 6 Emerging Pandemic Threats (EPT), while waiting for additional funding to carry out the planned activities for the year. However, the expected funding support was eventually canceled, resulting in an early project closeout in July 2011. Therefore, this report only includes activities from March 2007 to July 2011.

Background

Highly pathogenic avian influenza (H5N1) has taken a significant toll on the domestic poultry population in countries throughout Southeast Asia, including Bangladesh. The poultry industry (domestic chickens and turkeys) significantly impacts investments in Bangladesh; poultry is also a source of basic nutrition for the population. An agro-based economy, Bangladesh has a large poultry sub-sector, engaging approximately 5 million people on 150,000 poultry farms. The country has a backyard poultry population of approximately 185 million and a duck population of about 37 million. Almost every household, particularly in rural areas, has a mini-poultry farm, which are the individual household's economic support and; with commercial farms, supply the nutritional needs for 160 million citizens of Bangladesh.

The first confirmed outbreak of H5N1 in Bangladesh occurred on March 22, 2007; it affected 11 farms in three districts: Dhaka, Gazipur, and Narayanganj. By mid-2008, the number of affected districts quickly increased to 47. By December 2010, the number rose to 49 out of 64 districts.

In response to these outbreaks, the Government of Bangladesh worked with USAID and other partners, including the Food and Agriculture Organization (FAO), the United Nations International Children's Fund (UNICEF), and the World Bank to formulate the National Pandemic Preparedness policy. The partners immediately mobilized public and private sector resources to stop the spread of the disease. A variety of commodities are required to implement surveillance, outbreak response, and wet market (outdoor market) decontamination activities. To support these interventions between 2007 and 2011, the U.S. Agency for International Development (USAID) provided commodity support—\$1,541,913 in products—ranging from rapid test kits, to personal protective gear, to disinfectant.

To support these investments, USAID asked the USAID | DELIVER PROJECT to provide technical assistance that would strengthen the GOB's in-country supply chain for AI-related commodities. An initial assessment of the existing logistics system for AI supplies revealed that Bangladesh's animal health logistics system needed intensive intervention to support AI commodity availability and to ensure the program's success. To improve commodity management in the animal health supply chain in Bangladesh, the USAID | DELIVER PROJECT, as USAID's logistics management system (LMS) improvement partner, was uniquely qualified to offer assistance because of our experience during many years in the health care sector.

The design and implementation of a series of logistics system improvements for AI supplies were based on the project's assessment findings. From early 2007 to January 2011, working directly with the Ministry of Fisheries and Livestock (MOFL), Division of Livestock Services (DLS); the Strengthening Support Services for Combating Avian Influenza in Bangladesh (SSCAIB); and various local and international partners; the project's interventions began under Task Order 2 Avian Influenza. From February 2011 to July 2011, when the office closed due to the lack of funding, the project's assistance to the GOB continued under Task Order 6 Emerging Pandemic Threats (EPT), which has a wider focus on pandemic influenza and other emerging threats. This report summarizes the work and accomplishments during these four and a half years.

Avian Influenza Logistics System Assessment

As a first step, the project, with the DLS, conducted two field studies in 2007 and 2008 to analyze the existing logistics system and to identify areas for improvement. These rapid assessments included what the government would need to know if they had to respond to an outbreak and had to supply commodities anywhere in the country. The findings are summarized below:

- *Warehousing:* Every District Livestock Office (DLO) and Upazila Livestock Office (ULO) had a designated storeroom for avian influenza (AI) supplies. In addition, 17 districts had additional storage buildings with cold rooms, but they were not being used at the time of the assessment. Storage areas did not have appropriate or adequate storage equipment, such as racking or firefighting equipment.
- *Human resource capacity:* A storekeeper position was not identified in the DLOs and ULOs and they did not have standard guidelines or procedures for storing and managing commodities; staff had not received training on commodity management.
- *Recordkeeping and reporting:* Although the ULO routinely prepares monthly reports, recordkeeping was not standardized; and they did not have a commodity or logistics reporting system.
- *Inventory management:* They did not have policies or procedures for monitoring stock levels, conducting routine physical inventory counts, ordering supplies, or disposing of damaged or expired goods. As a result, the system had frequent supply imbalances, which caused overstocking in some upazilas and stockouts in others. In addition, monitoring of commodity shelf life, consumption, or supply needs was not done.

The project, after carefully analyzing the findings, presented recommendations to USAID, the DLS, and other in-country AI stakeholders to assist the DLS in building a viable supply chain for managing AI commodities. To address the immediate outbreak response needs and the longer-term system improvements, the group decided to implement a two-pronged approach for the supply chain management technical assistance. The goal was to develop a rapid response commodity management system that could quickly react to any AI or emerging pandemic threat from a zoonotic disease outbreak, thus reducing the threat and impact of future AI outbreaks.

Project Interventions

Based on the assessment findings, the project launched a two-pronged approach to address the immediate needs and the long-term logistics system improvements. Short-term interventions included immediately improving the central storage facility, providing appropriate storage equipment, and reorganizing the storeroom. In addition, and in line with the project's recommendations, the DLS assigned dedicated store in-charges at DLO and ULO levels; this created a backbone for a strong LMS. The project introduced a simple system for managing AI supplies at all levels, including a system for determining order and issue quantity; periodic physical inventory counts; procedures for disposing of expired, damaged, or unusable goods; and regular reporting of logistics management information. It also included streamlining reporting and recordkeeping by introducing standardized forms and registers. These initial investments were built on using longer-term interventions that included strengthening human resource capacity throughout the system; developing a supply chain management procedures manual; and updating the initial paper-based reporting system with an innovative, computerized inventory control and logistics management information system (LMIS), including web-based reporting at all levels.

Warehouse Management Improvements



SSCAIB refurbished store is now a model for the DLO stores.

The DLS Central Medical Stores (CMS)/Central Warehouse (CWH) is a 4-story building with 11,500 square feet of space. Animal health and AI commodities were stored there, including USAID-donated decontamination kits, Virkon S disinfectant, personal protective equipment (PPE) kits, cotton rolls, drugs, medicines, and packing materials and equipment. Although the warehouse had adequate storage furniture—racks, almirahs (similar to a cupboard), and dunnage—they were not being used correctly. The commodities were haphazardly placed on the floor, exposing them to dampness, damage, and quality deterioration. They did not follow a standard layout plan for storing commodities. Inventory recordkeeping was

irregular; there was no logistics reporting and no storage guidelines to maintain the items in acceptable quality. This situation prevailed because the CWH personnel were unfamiliar with best warehousing practices; the situation was similar in the DLO stores. The stores had no storage furniture and no regular storekeeper, and they were full of unusable items. There were no recordkeeping procedures for inventory control and management of the commodities. Moreover, the refrigerator, vaccines, Virkon S, PPE kits, Karcher sprayers, and medicines were dumped in the DLO office rooms.

To improve tracking and management of AI commodities, the 2,250 square foot first floor of the CWH was dedicated to AI. The floor was divided into two wings—the eastern part was used for

Virkon S, decontamination kits, and FAO-donated materials; the western wing was used for the PPE kits only. To complete the reorganization process, the project introduced manual inventory records; later, we provided a computer and installed the livestock warehouse inventory management system (LWIMS). This improved the visibility of stock movement of AI commodities for the concerned storekeepers, Deputy Director, and store officers. Finally, the web-based LMIS was installed to upload the monthly logistics report they would use for decisionmaking. Throughout this time, the project provided a logistics technical officer (LTO), who was dedicated to the CMS/CWH, and who regularly provided on-site assistance for any difficulty related to computerized recording and uploading; the LTO also supported warehousing best practices.

In addition to the improvements at the CWH, the project provided technical assistance to the SSCAIB to develop specifications for appropriate storage furniture. To demonstrate the recommended layout plan so others could follow the guidelines, the team reorganized five DLO stores with the SSCAIB-supplied furniture. Working with the project, the DLO cleaned and removed all unusable items from the store. The medicines; vaccines; refrigerators; and information, education, and communication (IEC) materials were transferred from the DLO office to the storeroom. The storeroom was then reorganized using the Store Layout Plan with SSCAIB-supplied furniture (four racks, four dunnage, two almirahs, and one ladder) in each of the renovated stores. The project provided inventory control registers and issue vouchers, verified records with the physical balance, and reconciled the accounts. The project suggested that the DLOs issue the short shelf life Virkon S immediately to avoid expiry in August 2009. By executive order of the Director General, a storekeeper-in-charge was assigned to each of the five renovated stores. Later, the SSCAIB provided storage equipment to replicate this model in the remaining 59 DLO stores.

Design and Implement Web-Based LMIS

In a meeting facilitated by the project, high-level officials at the MOFL discussed the challenges of a rapid response to an outbreak; they decided to move the DLS from its manual reporting and communication system to an innovative web-based LMIS. Thus, the term Digital DLS initiative began. Prior to the project's intervention, DLS had 14 types of manual monthly reports to track their program activities. The reports focused solely on DLS microcredit and tree planting activities, which did not need logistics supplies and services. However, animal health care activities—which did require drugs, vaccines, and medical equipment—had no associated reporting. With the approval of DLS, the project developed a procedures manual for supply chain management and also developed different paper-based forms for routine and accurate recording and reporting of logistics transactions. This system was implemented in the CMS, 64 DLO stores, and 489 ULO stores.

The paper-based reporting system was later computerized and linked to the Internet to create a web-based LMIS. Through the web-based LMIS, districts enter reports online, the supervising and supply personnel view the reports online for monitoring, and then can use the reports when they make supply decisions. This enables DLS management to track country stock status and to quickly mobilize resources to avoid unwanted stockouts of the critical AI commodities. Although DLS has



The project team training staff on the web-based logistics information management system.

approximately 250 items on its drugs, medicines, and equipment list; the project initially took 19 fast-moving items, particularly vaccines and AI commodities, and incorporated them into the monthly logistics report. After field testing, the remaining items were included. By the first quarter of 2011, all 64 districts were reporting online through the web-based LMIS, with a monthly on-time reporting rate of >98 percent.

Human Resource Capacity Building

The success of the DLS animal health supply chain depends largely on the knowledge and skills of the storekeepers and managers who perform the day-to-day logistics functions. To keep the system fully functional, the project developed a detailed manual, *Supply Chain Management Procedures Manual*, that included a comprehensive training curriculum for both the storekeepers-in-charge and their managers, at both DLO and ULO levels. All 64 district storekeepers (DSKs) with their DLOs, 489 ULOs with their upazila storekeepers, CMS staff, Livestock Research Institute (LRI) staff, plus deputy directors of the seven divisions were trained how to use the newly developed register and logistics forms. Special attention was paid to helping DLOs and DSKs use the web-based LMIS for electronic uploading of the monthly reports, which are due by the 10th of the following month. Periodic refresher training for all the appropriate staff was also organized; this kept the staff updated and motivated. After a significant investment was made to train the three DLS headquarters' officers on the new system of recording and reporting, they were able to centrally track the total operation of the new LWIMS and web-based LMIS, especially after the project phased out. In all, 1,077 personnel received the training.

Skills development for the assigned storekeepers-in-charge at the central, district, and upazila levels—and their managers—was critical because the project interventions were new to them. Through routine monitoring visits, LTOs from the project provided on-the-job training to district and upazila livestock officers; and store in-charges at the DLOs and ULOs to correct any mistakes in stores management, recordkeeping, or reporting.

Support AI Partners' Live Bird Market Decontamination



The project's country team leader visited a live bird market for the decontamination program.

As the logistics management implementing partner for USAID, the project provided logistics support to the AI partners' live bird market (LBM) decontamination activity. The project worked closely with the Dhaka City Corporation (DCC), wholesale live bird markets, and LBM committees and associations to identify and quantify equipment and supplies needed to support the decontamination program. In addition, the project procured and distributed 42 Karcher power sprayers, 10,000 liters of detergent, and Virkon disinfectant for the proactive decontamination activity in 42 LBMs throughout Bangladesh. The project team worked with USAID and other AI partners to visit the LBMs and monitor the consumption of Virkon S and detergents

for decontamination, and worked with the chief veterinary officers (CVOs), DLS, and USAID's STOP-AI project to develop a one-page users guide for diluting Virkon S.

Establish a Rapid Response System for AI Commodities

When an outbreak is reported, it is critical to respond immediately with a supply of needed commodities. To ensure the availability of supplies, and to reduce distribution time and facilitate a rapid response, the project team pre-positioned critical supplies at the upazila level. The DLS and the project team put two specific approaches in place. First, to facilitate rapid communication among stakeholders, they developed a communication tree that lists contact phone numbers (office and mobile) for all personnel working with supplies. Second, the project supported the DLS to ensure access to the latest inventory data so that parties responding to an outbreak could identify the closest location of AI commodities and respond in the shortest possible time. If an outbreak was reported, the DLS developed and issued a standing circular that explains the instructions.

Support Collaboration and Coordination among Partners



USAID representative presided over the avian influenza partners' meeting at the project's office.

Recognizing the project's leading coordinating role and its excellent working relationship with the DLS, USAID asked the project to be the point of contact for USAID-funded AI partners. In this capacity, the project organized monthly meetings and other events on behalf of USAID. FAO, Stamp Out Avian Influenza (STOP AI), PREVENT, UNICEF, SSCAIB, Avian Influenza Preparedness and Response Project (AIPRP), International Centre for Diarrheal Disease Research, Bangladesh (ICDDR, B), and Directorate General of Health Services (DGHS)/World Health Organization (WHO)/Expanded Programme on Immunization (EPI) were the co-partners working to combat and contain AI.

The project created a strong, effective relationship with all the partners. In addition, the project was chosen to serve as Secretariat of the USAID | Bangladesh Lessons Learned and Dissemination Workshop on the H5N1 virus, held on October 13, 2010. The project also participated in USAID-organized edu-entertainment programs, including AMERICA week.

In addition to this overall support to the USAID AI partner community, USAID asked the project to provide technical aid to the SSCAIB's overall program management; in particular, the supply chain aspects of the Technical Assistance Project Proforma (TAPP). By providing technical assistance, the project worked with the SSCAIB to improve the infrastructure of the DLOs and ULOs and printed standardized registers and forms for DLS facilities at all levels. To ensure that DLO stores had the exclusive use of computers for logistics recording and reporting, we also advocated for computers to be included in the TAPP budget. In addition, with project technical support, the TAPP funded the installation of Internet connectivity through the Bangladesh Telecommunication Company, Limited (BTCL), and also supplied storage furniture for all DLO and ULO stores.

Support Deployment of H1N1 Vaccine and Ancillary Supplies

To prevent the spread of the virus when the H1N1 pandemic influenza A virus struck in April 2009, WHO, the United States, and other partners provided H1N1 vaccine and ancillary supplies (auto-disable syringes and safety boxes) to countries throughout the world. The project was closely involved in this activity, particularly in developing the National Plan of Action for Pandemic Influenza Vaccination; and before the vaccination campaign began, distributing the vaccine and ancillary supplies throughout Bangladesh.

The project successfully received, stored, and distributed 2.5 million H1N1 vaccines and ancillary products (over 2.6 million syringes and 30,200 safety boxes) to even the most remote vaccination sites. Based on the WHO vaccine deployment guidelines, the distribution had to be planned and completed within a limited time period, requiring significant coordination with the government to successfully implement the activity. The fact that the vaccine had only three months of shelf life remaining when the shipment arrived at the peak of the hot season, made the logistics planning and implementation extremely challenging. Building on the EPI transport system, the project was able to deliver the vaccine and ancillary supplies and maintain the cold chain throughout the distribution process.



The project transported H1N1 ancillary products to civil surgeon offices.

Accomplishments and Conclusions

The onset of AI in Bangladesh affected approximately 80 percent of the total districts in the country, leading to the culling and destruction of an enormous number of birds and eggs. This created a strained economic situation for both wholesale and retail traders, resulting in lost revenues and increased unemployment in the sector. In response, the GOB planned and implemented a national policy that included donors and national and international organizations in prevention and containment activities. Because of the leadership of the GOB, private sector efforts, and donor contributions, the country saw a reduction in outbreaks, which encouraged investors and the business community. The project, as a leading partner, did its best to ensure the availability of critical commodities to combat and prevent outbreaks by strengthening the DLS commodity logistics system for both immediate and long-term needs.

The project's collaboration with the DLS resulted in the design and implementation of an innovative web-based LMIS, with monthly reporting and significant capacity built throughout the system to sustain the improved logistics management practices and to ensure rapid response capabilities. Project technical assistance plans under Task Order 2 and Task Order 6 were based on a gradual phase-in of supply chain procedures and systems to strengthen local capacity in responding to outbreaks of AI and to move toward DLS ownership and operation over several years. Investments in developing a web-based LMIS, an inventory management system, and the Rapid Response system of communication for mobilizing and distributing supplies during AI outbreaks, were made with the expectation and understanding that these interventions would require a longer-term period of technical support to successfully implement the system within the DLS.

With the unexpected closure of the Bangladesh field office in July 2011, project technical assistance had to be reduced. Three local consultants are providing short-term technical assistance (STTA) to the DLS during a transition period. The STTA is focused only on the most critical areas of need in supply chain management to enable the DLS to maintain the web-based LMIS, the inventory management system, and the rapid response system. To ensure continuity and technical quality, all three consultants are former USAID | DELIVER PROJECT staff located in Bangladesh who previously worked on TO2 and TO6 activities. This technical assistance will be provided through September 2012, when it is anticipated that the DLS will have significantly strengthened its capacity to manage the new logistics system for AI commodities.

Appendix A

Quantity and Value of Commodities Shipped

QUANTITY AND VALUE OF COMMODITIES SHIPPED Avian Influenza and Emerging Pandemic Threats Commodities BANGLADESH 2007–2011

No.	Item Description	Total Quantity	Total Commodity Cost	Shipping & Handling Cost	Total Cost
1	Autoclave, Vert. Top Load (100075)	1	\$18,022	\$1,900	\$19,922
2	Bag, Red, Biohazard 25×35in (100341)	40	\$36	\$42	\$78
3	Beaker, 1000ml Polypropylene, (100094)	1	\$48	\$3	\$51
4	Beaker, 2000ml Polypropylene, (100095)	3	\$105	\$7	\$112
5	Beaker, 500ml Polypropylene (100093)	1	\$32	\$2	\$34
6	Boot, Haz Mat, Size L, Yellow (100324)	10	\$45	\$51	\$96
7	Cleaner, All purpose, [KARCHER (100387)]	54	\$5,670	\$4,373	\$10,043
8	Disinfectant, [Virkon], Al (100111)	2,600	\$546,000	\$21,330	\$567,330
9	Disinfectant, Virkon S 10lb (100436)	2,396	\$93,552	\$9,123	\$102,675
10	Document Imaging System (100076)	1	\$8,441	\$533	\$8,974
11	Electrophoresis System, Submar (100077)	2	\$2,116	\$67	\$2,183
12	Gloves, scrub, latex, size 10, (100170)	20	\$0	\$0	\$0
13	Ice Pack [Saf-T-Pak -314] (100037)	80	\$426	\$456	\$882
14	Kit, 3D (100340)	3	\$1,964	\$2,241	\$4,205
15	Kit, Decon 2.25gl sprayer, Al (100033)	205	\$71,750	\$18,658	\$90,408
16	Kit, Lab v2, Al (100069)	1	\$590	\$151	\$741
17	Kit, SBS (100339)	3	\$638	\$728	\$1,366
18	Pipet Tips, [SureOne TP] Bulk, (100086)	1	\$20	\$1	\$21
19	Pipet Tips, [SureOne TP] Rack, (100085)	1	\$30	\$2	\$32
20	Pipet Tips, Aerosol Barrier 1m (100088)	1	\$32	\$2	\$34
21	Pipet Tips, Aerosol Barrier, 1 (100087)	1	\$63	\$4	\$67
22	Pipetter, Adj Vol 5-10ul (100100)	1	\$289	\$18	\$307
23	Pipetter, Adj Volume 2-20ul (100101)	1	\$289	\$18	\$307
24	Pipetter, Adjustable Volume 10 (100102)	1	\$289	\$18	\$307
25	Pipetter, Adjustable Volume 10 (100104)	1	\$289	\$18	\$307
26	Pipetter, Adjustable Volume 20 (100103)	1	\$289	\$18	\$307
27	PPE Kit Large (100043)	30,750	\$269,063	\$13,911	\$282,974
28	PPE Kit Small (100042)	6,750	\$59,063	\$17,597	\$76,660
29	PPE Kit XLarge (100044)	175	\$1,531	\$1,379	\$2,910

QUANTITY AND VALUE OF COMMODITIES SHIPPED
Avian Influenza and Emerging Pandemic Threats Commodities
BANGLADESH 2007-2011

No.	Item Description	Total Quantity	Total Commodity Cost	Shipping & Handling Cost	Total Cost
30	Purifier of Water, PUR, 4 grs (100333)	20	\$9	\$10	\$19
31	Rack, Tube Thin-Walled Plastic (100081)	1	\$41	\$3	\$44
32	Rack, Tube, 4-way flipper (100082)	4	\$144	\$9	\$153
33	Rack, Tube, Microcentrifuge (100080)	10	\$382	\$24	\$406
34	Rotary Nozzle for washer press (100389)	42	\$1,852	\$396	\$2,248
35	Safety Box Sharp Disposable 5L (100605)	30,200	\$31,106	\$22,633	\$53,739
36	Shipper, Infectious Substance (100036)	20	\$538	\$575	\$1,113
37	Spare part package, for washer (100390)	1	\$668	\$143	\$811
38	Stand, Pipetter Carousel, AI (100105)	1	\$115	\$7	\$122
39	Syringe, auto-disable, 0.5ml (100577)	2,625,600	\$133,906	\$79,553	\$213,459
40	Tape, Duct, 1in x 60yds, Iuni (100312)	4	\$14	\$16	\$30
41	Test, Poultry FLU Detect , AI (100003)	289	\$41,600	\$2,946	\$44,546
42	Tip, Barrier, 1000 Clr (100099)	1	\$124	\$8	\$132
43	Tip, Barrier, 100re Clr (100097)	1	\$125	\$8	\$133
44	Tip, Barrier, 10re Clr (100096)	1	\$125	\$8	\$133
45	Tip, Barrier, 200re Sf (100098)	1	\$125	\$8	\$133
46	Transport Medium, Viral, AI (100038)	100	\$5,648	\$492	\$6,140
47	Tray,Stainless 16-1/2x10x2-1/2 (100092)	2	\$128	\$8	\$136
48	Tray,Stainless,12-1/2x7-3/4x2-1/4 (100091)	2	\$146	\$9	\$155
49	Tray,StainlessSteel,10x6-1/2x2 (100090)	2	\$115	\$7	\$122
50	Tube, Centrifuge, 15ml (100078)	1	\$173	\$11	\$184
51	Tube, Centrifuge, Plastic 50ml (100079)	1	\$237	\$15	\$252
52	Tube, Locking-Lid Microcentrif (100089)	1	\$34	\$2	\$36
53	Tube, PCR, Thin Wall, 0.2mL wi (100083)	3	\$222	\$14	\$236
54	Underpads, Super-Absorbent (100084)	1	\$195	\$12	\$207
55	Washer High-pressure [Karcher] (100388)	42	\$36,155	\$7,736	\$43,891
GRAND TOTAL			\$1,334,609	\$207,304	\$1,541,913

Appendix B

Country Publications

- Trainers Instruction Manual for Logistics Management Training for Upazila Store In-Charges
- Trainers Instruction Manual for Logistics Management Training for District Store In-Charges
- Training Handout for District Livestock Officers
- Training Handout for Upazila Livestock Officers
- User Guide for Livestock Warehouse Inventory Management System (LWIMS)
- User Guide for Web-based LMIS
- Brochure: *Bangladesh Web-based Logistics Management Information System*
- Brochure: *Bangladesh Web-based Logistics Management Information System (Bangla)*
- Brochure: *Livestock Warehouse Inventory Management System (LWIMS)*
- Brochure: *Livestock Warehouse Inventory Management System (LWIMS) (Bangla)*
- Installation Manual for LWIMS
- Installation Manual for Web-based LMIS
- DLS Logistics Procedures Manual

- *Avian Influenza in Bangladesh: An Assessment of the Logistics Management System of the Department of Livestock Services. August 2007*
- *Bangladesh Final Report: Rapid Assessment 2008 for the Department of Livestock Services Logistics Management System. March 2009*
- *Success Story: The USAID | DELIVER PROJECT Supports Avian Influenza Containment Efforts in Bangladesh. May 2009*
- *Success Story: Bangladesh Teams with the USAID | DELIVER PROJECT to Reduce Reporting Time. March 2010*

For more information, please visit deliver.jsi.com.

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