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PROJECT PERFORMANCE ASSESSMENT REPORT

FEDERAL REPUBLIC OF NIGERIA

**AVIAN INFLUENZA CONTROL AND HUMAN PANDEMIC PREPAREDNESS
AND RESPONSE PROJECT
(IDA-41600)**

March 28, 2013

IEG Public Sector Evaluation
Independent Evaluation Group

Currency Equivalents (annual averages)

Currency Unit = Nigerian Naira (₦)

2006	US\$1.00	128 ₦
2010	US\$1.00	155 ₦

Abbreviations and Acronyms

BSL	Biosecurity Level
FAO	Food and Agriculture Organization
GPAI	Global Program on Avian Influenza
HPAI	Highly Pathogenic Avian Influenza
ICR	Implementation Completion and Results report
IDA	International Development Association
IEG	Independent Evaluation Group
IEGPS	IEG Public Sector Evaluation
ILRI	International Livestock Research Institute
LGA	Local Government Area
OIE	World Organization for Animal Health
PPAR	Project Performance Assessment Report
WHO	World Health Organization

Fiscal Year

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Principal Ratings

	<i>ICR*</i>	<i>ICR Review*</i>	<i>PPAR</i>
Outcome	Satisfactory	Satisfactory	Moderately Satisfactory
Risk to Development Outcome	Moderate	Moderate	Significant
Bank Performance	Satisfactory	Satisfactory	Satisfactory
Borrower Performance	Satisfactory	Moderately Satisfactory	Moderately Satisfactory

* The Implementation Completion and Results Report (ICR) is a self-evaluation by the responsible Bank department. The ICR Review is an intermediate IEGPS product that seeks to independently verify the findings of the ICR.

Key Staff Responsible

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The Independent Evaluation Group assesses the programs and activities of the World Bank for two purposes: first, to ensure the integrity of the Bank's self-evaluation process and to verify that the Bank's work is producing the expected results, and second, to help develop improved directions, policies, and procedures through the dissemination of lessons drawn from experience. As part of this work, IEG annually assesses 20-25 percent of the Bank's lending operations through field work. In selecting operations for assessment, preference is given to those that are innovative, large, or complex; those that are relevant to upcoming studies or country evaluations; those for which Executive Directors or Bank management have requested assessments; and those that are likely to generate important lessons.

To prepare a Project Performance Assessment Report (PPAR), IEG staff examine project files and other documents, visit the borrowing country to discuss the operation with the government, and other in-country stakeholders, and interview Bank staff and other donor agency staff both at headquarters and in local offices as appropriate.

Each PPAR is subject to internal IEG peer review, Panel review, and management approval. Once cleared internally, the PPAR is commented on by the responsible Bank department. The PPAR is also sent to the borrower for review. IEG incorporates both Bank and borrower comments as appropriate, and the borrowers' comments are attached to the document that is sent to the Bank's Board of Executive Directors. After an assessment report has been sent to the Board, it is disclosed to the public.

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Outcome: The extent to which the operation's major relevant objectives were achieved, or are expected to be achieved, efficiently. The rating has three dimensions: relevance, efficacy, and efficiency. *Relevance* includes relevance of objectives and relevance of design. Relevance of objectives is the extent to which the project's objectives are consistent with the country's current development priorities and with current Bank country and sectoral assistance strategies and corporate goals (expressed in Poverty Reduction Strategy Papers, Country Assistance Strategies, Sector Strategy Papers, Operational Policies). Relevance of design is the extent to which the project's design is consistent with the stated objectives. *Efficacy* is the extent to which the project's objectives were achieved, or are expected to be achieved, taking into account their relative importance. *Efficiency* is the extent to which the project achieved, or is expected to achieve, a return higher than the opportunity cost of capital and benefits at least cost compared to alternatives. The efficiency dimension generally is not applied to adjustment operations. *Possible ratings for Outcome:* Highly Satisfactory, Satisfactory, Moderately Satisfactory, Moderately Unsatisfactory, Unsatisfactory, Highly Unsatisfactory.

Risk to Development Outcome: The risk, at the time of evaluation, that development outcomes (or expected outcomes) will not be maintained (or realized). *Possible ratings for Risk to Development Outcome:* High, Significant, Moderate, Negligible to Low, Not Evaluable.

Bank Performance: The extent to which services provided by the Bank ensured quality at entry of the operation and supported effective implementation through appropriate supervision (including ensuring adequate transition arrangements for regular operation of supported activities after loan/credit closing, toward the achievement of development outcomes. The rating has two dimensions: quality at entry and quality of supervision. *Possible ratings for Bank Performance:* Highly Satisfactory, Satisfactory, Moderately Satisfactory, Moderately Unsatisfactory, Unsatisfactory, Highly Unsatisfactory.

Borrower Performance: The extent to which the borrower (including the government and implementing agency or agencies) ensured quality of preparation and implementation, and complied with covenants and agreements, toward the achievement of development outcomes. The rating has two dimensions: government performance and implementing agency(ies) performance. *Possible ratings for Borrower Performance:* Highly Satisfactory, Satisfactory, Moderately Satisfactory, Moderately Unsatisfactory, Unsatisfactory, Highly Unsatisfactory.

Preface

This is the Project Performance Assessment Report (PPAR) for the Avian Influenza Control and Pandemic Preparedness and Response Project for Nigeria (IDA-41600) under the Global Program for Avian Influenza.

The project was approved on March 29, 2006 and became effective on July 22, 2006. A total of \$US 50 million was committed for the project, and additional financing was made available from reallocations out of financing for the Fadama II project (\$US 7.2 million) and the Health System Development Project II (\$US 5 million) for total commitments of \$62.20 million. At project closure, \$US 49.9 million had been disbursed. The project was extended twice, first to December 2010 and then to May 31 2011 when it closed, almost 2 years behind schedule.

The report presents findings based on a review of the project's Implementation Completion and Results Report, appraisal report, legal documents, and other relevant material. An IEG mission to Nigeria in October-November 2012 held discussions with World Bank country office staff, government officials and agencies, project staff, partner agencies, donors, beneficiaries, and others (see Annex C). The mission visited Asokoro Hospital in Abuja, the Veterinary Teaching Hospital at the University of Ibadan, the University College Hospital at the University of Ibadan, the Kuto live bird market in Abeokuta, the Oja Oba live bird market in Lagos, and the border quarantine station at the Seme border. The contributions of all stakeholders, including World Bank staff in Abuja, are gratefully acknowledged. Administrative and logistical support from Deborah Olumolu in the Abuja Country Office was greatly appreciated.

Following standard IEG procedures, copies of the draft PPAR were sent to relevant Government officials and agencies for their review and comment, but no comments were received.

Summary

Following outbreaks of highly pathogenic avian influenza in Vietnam in 2003, there has been global concern about the risk of avian influenza because of its threat to poultry, the risk of human infection, and fears that the virus could mutate to cause a strain that could be transmitted between humans, triggering a potentially catastrophic pandemic. In January 2006, outbreaks of avian influenza were identified in poultry farms in Nigeria. The government of Nigeria moved rapidly to respond, and requested World Bank support to assist with the unfolding emergency. Parallel technical and other financial support was provided by a number of international agencies and donors, including the Food and Agriculture Organization, the World Health Organization, the World Organization for Animal Health, the United Nations Children's Fund, the United States Agency for International Development, and the United States Centers for Disease Control and Prevention.

The objectives of the \$49.9 million Nigeria Avian Influenza Control and Human Pandemic Preparedness Project (2006-2011) were to *minimize the threat posed to the poultry industry and humans by Highly Pathogenic Avian Influenza infection and other zoonoses and to prepare for, control, and respond to influenza pandemics and other infectious disease emergencies in humans*. These goals were highly relevant given the unfolding emergency and the possible risks of a pandemic. The project design followed the general template of the Global Program for Avian Influenza. The main elements of the project included support for the creation of a network of avian influenza desk officers at the state and local government level; provision of training, equipment, and other support for containing the outbreak; creation and dissemination of a public awareness and communication campaign; a compensation mechanism for birds culled during containment operations; and support for upgrading diagnostic and surveillance systems for animal and human health systems.

The project was generally successful in containing the avian influenza outbreaks. Three hundred avian influenza outbreaks occurred in Nigeria from 2006-8, leading to the deaths of 2 million birds through disease and culling and to one confirmed human fatality. Containment efforts were successful in part due to high level governmental support for these efforts and effective collaboration between the Ministries of Agriculture, Health, and Information at both the federal and state level. Initial communication messages were overly alarmist, potentially contributing to a drop in the demand for poultry and economic losses to farmers. The communications strategy rapidly corrected this after incorporating stakeholder concerns. Awareness levels of avian influenza were high at the end of the project and stakeholders reported that they believed the campaign to be effective, but shortcomings in monitoring and evaluation prevent an assessment of the extent to which the communication campaign was responsible, and evidence is lacking on changes in behavior.

Once the outbreaks were contained, the level of attention to the project declined. Procurement of civil works and equipment was slow due to a lack of procurement capacity. Significant improvements were made in surveillance and diagnostic capacity for influenza in both poultry and humans, but geographic coverage was incomplete. Some

facilities were not operational at project closure or at the time of the IEG assessment mission, 18 months later. The project substantially improved the ability to contain avian influenza outbreaks in poultry and the ability to detect influenza in humans, and it led to some improvements in the ability to detect avian influenza in poultry (including an increase in disease reporting rates and diagnostic speed), but did little to assist in the ability to detect or respond to other zoonoses, and had only a modest impact on preparedness for other human infectious disease emergencies.

Though the economic benefits of the project are likely to have been high and coordination across ministries was reportedly good, there were a number of weaknesses in the efficient implementation of the project, reflected in substantial delays and in equipment or works that did not meet local requirements or were not being used. One cause of these problems were weaknesses in communication between centralized procurement officers and end users.

The overall project outcome is rated *moderately satisfactory*, reflecting highly relevant objectives and substantial design relevance, substantial achievement of both the animal and human health objectives, and modest efficiency – a moderate shortcoming.

While substantial capacity gains have been made, it is not clear if these will be sustained because of a lack of funding. Surveillance and diagnostic systems need at least a moderate level of activity to be maintained, so that systems continue functioning and could be ramped up to a high level of activity if further outbreaks occurred. This would require additional funding for active surveillance programs, laboratory consumables, and refresher training courses. Consequently, the risk to development outcome is rated *Significant*.

Bank performance is rated *satisfactory*. Project preparation was very rapid, and supervision improved several aspects of the project at midterm review. However, there were weaknesses in the design of the monitoring and evaluation framework and in some implementation arrangements. Borrower performance is rated *moderately satisfactory*. The level of Government commitment was generally high, and there was a high degree of cooperation between government ministries, but inadequate procurement capacity in the implementing agencies led to delays throughout the project; the planned biosecurity level (BSL) 3 laboratory was not procured and some laboratories and live bird markets were not operational as of the IEG mission. Monitoring and evaluation implementation and utilization for project management was weak, in part because of fundamental challenges posed by a disease risk reduction and pandemic preparedness project but also because of weaknesses in design and implementation.

Building on the project experience this assessment identifies several lessons, including:

- Government and implementing agency prioritization and enthusiasm decline as perceived threats decline, inhibiting implementation of construction and works aimed at building long-term preparedness.

- An epidemic communication strategy requires inputs from all stakeholders, including the private sector. An initial lack of stakeholder input contributed to errors in the initial message being communicated.
- Pilots may have little impact in the absence of a rigorous assessment of the benefits and a clear plan for scale-up. In this case, the biosecurity and sanitation methods of live bird markets were not assessed and scale-up was not achieved.
- Compensation systems can be made more transparent by publishing names and amounts of compensation awards in local newspapers, online and through other media.
- Cross-ministry cooperation may be difficult in projects that involve multiple ministries if there is no single coordinator and if project staff for different components are housed in different locations.
- Lack of experienced procurement staff in the project management unit at project inception can compromise the timely response to an emergency.

Caroline Heider
Director-General
Evaluation

1. Background and Context

Country Background

1.1 Nigeria is Africa's most populous country, with roughly 162 million people. The economy is dominated by oil production, which constitutes roughly 40 percent of GDP. The livestock sector accounts for roughly 5.5 percent of GDP, and is a major source of employment and livelihoods for the poor. The broader agriculture sector, including livestock, accounts for roughly one third of GDP and 70 percent of employment.

1.2 The period since 1999 has been the longest period of civilian democratic rule in Nigeria since independence in 1960. Nigeria operates under a federal system, with government operating at the federal level, in 36 states plus the federal capital territory, and in 774 local government areas (LGA). The state governments control roughly 50 percent of revenues, and have considerable autonomy. An IEG evaluation of the World Bank program in Nigeria over 1998-2007 noted that progress prior to 2004 had been unsatisfactory, but that outcomes had improved since 2004 (IEG 2010). The evaluation noted improvements in macroeconomic performance and federal government performance, but with little improvement at the state and local government level, and with moderately unsatisfactory progress in creating a basis for sustainable non-oil growth, and in improving social service delivery and community empowerment.

1.3 Though the World Bank has had significant involvement in both Agriculture and Health sectors in Nigeria, these projects had little overlap with activities or agencies supported by the Avian Influenza Control Project (Table 1). In agriculture and rural development, the Second and Third Fadama projects (approved in 2003 and 2008) have focused on increasing incomes for people in rural areas through rural infrastructure, capacity building, advisory services, equipment purchases and other activities. But these activities were focused primarily on agriculture rather than livestock, and did not emphasize veterinary services or animal health. In the health sector, the Bank has supported institutional improvement through health systems development projects, and specific disease interventions for polio, HIV/AIDS and malaria. But there had been no prior interventions on zoonotic diseases or pandemic or other health emergency preparedness. While other donors have been active in supporting activities in both the health and agriculture sectors, most donor support for avian influenza risk reduction in Nigeria was supported under the Avian Influenza Control Project.

1.4 In recent years, Nigeria was seriously affected by the international economic crisis and corresponding decline in oil prices (World Bank 2011). This shock led to dramatic reductions in government revenue, currency depreciation, and banking sector difficulties. Economic growth continued, driven in part by large federal government expenditure, and coupled with double digit inflation and exhaustion of fiscal oil reserves in the Excess Crude Account.

1.5 Governance issues remain a central challenge across a wide range of sectors.

Table 1: Major Recent World Bank Financed Projects in the Agriculture and Health Sectors in Nigeria

Project Name	Years active:	Bank financing amount (\$m)	Activities supported
HIV/AIDS Program Development Project, and Additional Financing	2001-10	140	Reduce the risk of HIV/AIDS through behavior change and improved access to counseling, testing and care services.
Second Health Systems Development Project, and Additional Financing	2002-12	217	Strengthen state level health system management, primary care delivery, and federal health policy and sector performance monitoring.
Second National Fadama Development Project	2003-09	100	Increase rural incomes through capacity building, rural infrastructure/asset provision and advisory services.
Partnership for Polio Eradication Project, and Additional Financing	2003-12	140	Eradication of polio through vaccination campaigns.
Malaria Control Booster Project, and Additional Financing	2006-13	280	Increasing health system capacity to improve delivery of malaria interventions.
Third National Fadama Development Project	2008-13	250	Increase rural incomes through capacity building, rural infrastructure/asset provision, advisory services and research.
Commercial Agriculture Development	2009-14	150	Strengthen agricultural production systems and facilitate market access for rice, oil palm, cocoa, fruit trees, poultry production, aquaculture, dairy, and maize in 5 states.
HIV/AIDS Program Development Project II	2009-15	225	Reduce the risk of HIV/AIDS by scaling up prevention interventions and improving access to counseling, testing and care, and support services.

Disease and Project Context

1.6 The influenza A virus can cause influenza in birds and some mammals. A form of the virus adapted to birds known as Highly Pathogenic Avian Influenza A (H5N1), referred to as HPAI or simply avian influenza, has led to high mortality in poultry and some deaths in humans (Annex B1). Since 2003, there has been significant global concern about the risks posed by avian influenza, and cases have been detected in 61 countries. Avian influenza is primarily a disease of birds, but can potentially infect humans if they come into contact with infected birds. The virus has killed tens of millions of birds, and at least 400 million birds have been slaughtered to limit the spread of the virus (FAO 2012). As of August 2012, 608 cases had been confirmed among humans by the World Health Organization (WHO),

including 359 fatalities.¹ There is also the possibility that a mutated form of the virus could be transmissible between humans, which could trigger a global pandemic.

1.7 The World Bank responded to this global emergency through two mechanisms, the Global Program for Avian Influenza Control and Human Pandemic Preparedness and Response (GPAI) and the multi-donor Avian and Human Influenza Facility (Annex B2). The GPAI set up a template for avian influenza control projects, which focused on supporting capacity improvements for controlling and containing outbreaks, disease surveillance among animals and humans, diagnostic capacity, treatment capacity, awareness raising and behavioral change.

1.8 Nigeria faces four broad threats from avian influenza:

- Avian influenza outbreaks among poultry would lead to deaths among birds, and associated economic costs for poultry producers, transporters, traders, and consumers. This risk can be managed by improving biosecurity among birds, and by identifying and controlling outbreaks among birds.
- The disease could be transmitted to humans from infected birds in Nigeria, leading to human morbidity and mortality. This risk can be managed through the same steps that mitigate the risk among birds, and further through improving biosecurity and animal handling among humans, and by improving treatment capacity for humans.
- Outbreaks of avian influenza among birds in Nigeria could lead to a strain of influenza that is directly transmissible between humans, which could trigger a pandemic, with human mortality and morbidity throughout the world. The chance of this occurring is very low, but preventing it would offer enormous benefits for both Nigeria and the rest of the world. This risk can be reduced through the measures above that manage the risk among birds, as well as through improved biosecurity among humans; improved surveillance, diagnosis, isolation and treatment capacity among humans; and epidemic and pandemic preparedness.
- A strain of avian influenza transmissible between humans could emerge in another country, causing a pandemic that then spreads to Nigeria through movement of infected people. This could cause significant mortality and morbidity in Nigeria. This risk can be managed through improved surveillance, diagnosis, isolation and treatment capacity among humans; and by pandemic preparedness.

1.9 Avian influenza can be controlled most effectively at the source (FAO 2010, WHO 2009). Once outbreaks among poultry or humans have begun to spread, containment becomes more difficult and the costs of the disease are much higher. Thus, identifying and controlling outbreaks among birds contributes to addressing the most likely threat (losses to the poultry sector) and to other more severe threats (infections among humans).

1.10 Nigeria also faced significant threats from other zoonotic diseases (diseases that can be transmitted from animals to humans). Zoonotic diseases constitute at least 61 percent of all human pathogens (Ehizbolo and others 2011). Zoonotic diseases pose a significant threat

¹ These figures should not be used to imply that the virus has a 59 percent fatality rate among humans, since there are likely many more non-fatal human cases that have not been diagnosed.

to livestock sectors and to humans. Effective control of zoonotic diseases would mean a decreased disease burden, poverty reduction and increased food supply for large numbers of the rural poor worldwide (WHO 2006).

1.11 Other than avian influenza, the World Organization for Animal Health identifies 8 diseases as being a priority for animal health: contagious bovine pleuro-pneumonia, rinderpest, brucellosis, tuberculosis, food and mouth disease, Newcastle disease, African swine fever, and rabies (OIE 2010). Most of these diseases are primarily found in cattle, with Newcastle disease affecting poultry and African swine fever affecting pigs. The Organization recommended improving surveillance for these diseases, including active surveillance programs for tuberculosis, brucellosis, and African swine fever, and mass vaccination for contagious bovine pleuro-pneumonia, rinderpest and Newcastle diseases. Zoonotic diseases such as anthrax, brucellosis, bovine tuberculosis, rabies, lassa fever, animal trypanosomosis and echinococcosi are neglected in Nigeria, with nearly non-existent systems for control and an unknown impact on human health (Ehizbolo and others 2011).

1.12 In January 2006, outbreaks of highly pathogenic avian influenza in poultry were detected in Kaduna, Kano and Plateau states in Nigeria. The Federal Government began to respond, setting up a National Interministerial Steering Committee on Avian Influenza in February 2006, jointly chaired by the Federal Ministry of Agriculture and Rural Development and the Federal Ministry of Health.

1.13 The World Bank responded rapidly to client requests for assistance, preparing the Avian Influenza Control and Pandemic Preparedness and Response Project for Nigeria (henceforth “the Project”), preparing a concept note on February 14, 2006, moving to project approval by March 29, 2006, and obtaining project effectiveness on June 22, 2006.

2. Objectives, Design, and their Relevance

Objectives

2.1 The project development objectives stated on page 12 of the Technical Annex to the Financing Proposal (the equivalent of the Project Appraisal Document) were to “support the efforts of [the Federal Government of Nigeria] to minimize the threat posed by H5N1 to humans and the poultry industry, and prepare the necessary control measures to respond to a possible influenza pandemic.”

2.2 However, project development objectives stated in the Financing Agreement (page 4) were to “minimize the threat posed to the poultry industry and humans by HPAI infection and other zoonoses and to prepare for, control, and respond to influenza pandemics and other infectious disease emergencies in humans.”

2.3 This evaluation uses the statement in the Financing Agreement, which adds objectives to incorporate zoonotic and other infectious diseases beyond avian influenza. The objectives were not revised during implementation.

Relevance of Objectives

2.4 Nigeria faced particular risks from avian influenza because:

- the country had extensive unpatrolled borders and was in the fly-paths of wild birds from Asia and the Middle East, resulting in a moderate to high chance of the disease entering the country;
- there are large forested areas, high wild animal populations, and high human population density, which mean there is a high potential for virus reservoirs to develop and mutate;
- traditionally, there was extensive movement of people and livestock throughout the country, meaning the spread would probably be rapid in the event of an outbreak.

As a result, the Federal Government determined that a contingency plan was needed to combat the potential introduction of the disease, and a Comprehensive Contingency Plan was prepared and in place by November 2005. As noted above, the livestock sector and poultry industry also faced significant risks from other zoonoses.

2.5 Nigeria's capacity to control and contain an HPAI outbreak in poultry or humans was weak, especially its capacity for veterinary and health service delivery, disease surveillance, and diagnostics capabilities in both the animal and human health sectors.

2.6 The public sector managed a substantial share of animal health services, but those services had suffered as a result of years of underfunding by the government (World Bank 2006). A start had been made to resurrect public veterinary services under the Pan African Program for the Control of Epizootics initiative, but veterinary services were at that stage still rudimentary. Front line services were therefore provided mainly by private veterinarians (with variable levels of qualifications and service quality), who supplied and distributed veterinary drugs, vaccines, equipment, and livestock feed. Routine clinical checks and preventive care for livestock were far from universal, especially for smaller livestock owners. Surveillance was weak. There was no system of active surveillance for zoonoses, and only 7.3 percent of veterinary clinics and 14.5 percent of farms reported animal health data to contribute to passive surveillance. Responding to outbreaks would take 7-12 days after an initial report. Diagnostic capacity was limited; only one laboratory had the capacity to diagnose avian influenza in animals, and strain subtype identification and confirmation required testing internationally, which would take up to a month.

2.7 In the human health sector, the referral system was weak and undeveloped, with few links between the primary and secondary sub-sectors. Inadequate financial resources for the health sector (US\$ 2-3 per capita) caused drugs and medical supplies to become scarce and facilities to deteriorate. Diagnostics and surveillance faced several challenges, including incomplete and delayed reporting, poor logistical and communications support, and a lack of case definition and management protocols at surveillance sites. Only one hospital had the capacity to diagnose avian influenza among humans. Though a broad contingency plan existed prior to the project, operational response plans did not exist at national or state levels.

2.8 In January 2006, just weeks before project preparation began in February, the first of what would turn out to be 300 outbreaks of HPAI occurred in Nigeria.² The source of the virus was never clearly determined, but it is thought to have arrived through illegal poultry imports or through bird migration in the large wetland habitats in the north of the country. This outbreak, the first in Africa, posed a serious threat to Nigeria and other West and Central African countries, especially given the large cross-border trade in domestic poultry.

2.9 The project's objectives were, therefore, substantially relevant to the Government's urgent need to control the unfolding crisis, to build capacity to identify and respond to possible future outbreaks, and to build capacity to address other animal diseases threatening the livestock sector. They were also consistent with Nigeria's 2010-2013 Country Partnership Strategy with the World Bank Group, which was active at project closing. The project supported the strategy's Pillar II (Improved Environment and Services for Non-oil Growth) by improving the delivery of veterinary services to prevent and control avian influenza and other zoonoses in the livestock sector, an important source of agricultural growth. It also supported Pillar I (Improved Service Delivery for Human Development) by strengthening the Federal Ministry of Health's capacity to prevent and manage communicable diseases. The Strategy specifically mentions this project as an example of the Bank's ability to respond swiftly and flexibly to an emergency.

2.10 The relevance of objectives is rated *High*.

Design

COMPONENTS

2.11 The project had four components.

2.12 **Animal Health** (US\$29.20 million at appraisal, US\$26.78 million at closure). This component supported:

- Strengthening HPAI control and outbreak containment, including equipment and training for workers conducting stamping out operations, and vaccination of poultry.
- Strengthening disease surveillance, diagnostic capacity, and applied research, through training and laboratory upgrades (upgrading one lab to biosecurity level (BSL) 3 and constructing five BSL 2 labs).
- Strengthening veterinary quarantine services through training.
- Strengthening applied veterinary research to conduct research and field studies.
- Enhancing legal and regulatory frameworks for disease prevention and preparedness capacity by assessing national veterinary services, updating the National Emergency Contingency Plan for HPAI, and building human capacity.
- Improving bio-security in poultry production and trade to facilitate a longer-term strategy for preventing and managing HPAI and other zoonoses through improved hygiene at live bird markets and bio-security regulations for commercial poultry farms.

² An outbreak of avian influenza is an identified incident in a particular geographic area, which may involve thousands of cases among poultry.

- Compensation and economic recovery, by establishing a national compensation policy and fund; providing support to economically vulnerable groups; and providing alternative livelihoods for affected stakeholders based on demand-driven proposals.

2.13 **Human Health** (US\$18.25 million at appraisal, US\$18.17 million at closure). This component supported:

- Enhancing public health program planning, delivery, and coordination, including response coordination and management at the federal, state, and local government authority levels, through legislation, communication, and response plan development.
- Strengthening public health surveillance systems to address HPAI, including diagnostic capacity improvements through laboratory upgrades (8 BSL 2 labs), and technical assistance.
- Strengthening health system response capacity by improving clinical care capacity, conducting seasonal influenza vaccinations, and developing guidelines on phased social distancing measures.

2.14 **Social Mobilization and Strategic Communication** (US\$4.08 million at appraisal, US\$4.00 million at closure). This component promoted public awareness, participation, and coordination in executing the emergency contingency plans outlined under the national influenza plan.

2.15 **Implementation Support and Monitoring and Evaluation** (US\$6.89 million at appraisal, US\$0.95 million at closure), for support to project management. Most of the funds for implementation support were used directly by the animal and human health components.

2.16 There were no changes to the components during implementation, but there were reallocations. By late 2009, the perceived risk of further HPAI outbreaks had declined and thus the expected demand for compensation funds was modest, so the project reallocated \$4.8 million of the \$6.3 million of remaining compensation funds towards further biosecurity measures and construction of 11 additional live bird markets.

IMPLEMENTATION ARRANGEMENTS

2.17 Several implementation agencies had been set up prior to the conceptualization and appraisal of the Project. In anticipation of an eventual avian influenza outbreak, in late 2005 the Federal Government of Nigeria had inaugurated a Technical Committee of Experts for the Prevention and Control of HPAI. The committee devised prevention strategies in the country consistent with the GPAI. When the outbreak did occur in February 2006, the government, under the direct leadership of the President, moved quickly to set up a National Inter-Ministerial Steering Committee on Avian Influenza, co-chaired by the Minister of Agriculture and Rural Development and the Minister of Health. In addition, a National Technical Committee on Avian Influenza was established, chaired by both the Minister of State for Agriculture and Rural Development and the Minister of State for Health. This Technical Committee (on which the World Bank and other international agencies were represented) was responsible for the coordination and implementation of the emergency action plan and strategy proposed for the prevention and control of the outbreak.

2.18 The Project was designed to be implemented jointly by staff from three Federal Ministries: Agriculture and Rural Development, Health, and Information & Communications, with each component led by its own Component Coordinator. This structure at the Federal level was then to be replicated at the state level, with desk officers for each Ministry in every State government. Additionally, a desk officer was to be appointed at every local government area. The central Animal Health and Communications components were housed together, while the Health component was based on a separate site. Funds for the Communications component were channeled through the Animal Health component, which contributed to some delays in implementation of communications activities.

MONITORING AND EVALUATION DESIGN

2.19 The monitoring and evaluation (M&E) system design drew heavily on the Global Program on Avian Influenza blueprint. Where possible, baselines were provided. The responsibility for data collection was assigned to existing structures in the relevant ministries.

2.20 The nature of the project posed a number of inherent challenges for designing and implementing an effective M&E system. The desired project outcomes (reduction in risk from avian influenza outbreaks among poultry; level of preparedness for pandemics) were largely unobservable. The project was complicated, with many different activities and outputs. The emergency nature of the project meant that design needed to be very rapid, and meant that assessing baselines prior to implementation was infeasible for some aspects of the project (such as initial biosecurity levels or awareness levels).

2.21 Due in part to these challenges, the M&E system design contained a number of weaknesses. Indicators were focused largely on tracking achievement of outputs, such as the number of radio jingles produced, rather than outcomes, such as changes in knowledge or behavior. The indicators did not measure all aspects of the project objectives. For example, the indicators did not capture any aspects of risks or preparedness for diseases other than avian influenza, despite the inclusion of “other zoonoses” and “other infectious diseases” in the project objectives. Indicators were not designed to track the possibility of a decline in capacity; for example, they tracked whether biosecurity measures were implemented on farms, but not whether those systems remained in place over time. It tracked the number of facilities that reported animal health data, but did not track whether these reports continued regularly.

2.22 The project also included a pilot of improved live bird markets, which were to have better biosecurity than traditional markets, and the number of bird markets to be built was increased during project restructuring. But the M&E system did not include the kind of rigorous assessment of the biosecurity and public health benefits of these markets that might have contributed to scale-up of the markets if successful.

Relevance of Design

2.23 The project design was based on the Global Program for Avian Influenza and Human Pandemic Preparedness and Response template, adapted to take account of conditions in Nigeria. By the time the project was appraised, multiple outbreaks had commenced in the

country and the veterinary and human health services were ill-equipped to respond. The project design addressed weaknesses in livestock and human disease surveillance, outbreak containment, in-country diagnostic capacity, and public awareness. The design supported both emergency response activities to deal with the short-term risk, such as providing training, biosafety equipment, and transportation to teams that would conduct culling operations to contain outbreaks and setting up a compensation mechanism, and non-emergency activities that would reduce the long-term risk.

2.24 The Results Framework presented a logical causal chain between the activities financed by the project, the outputs these activities would produce, and the outcomes that would measure the attainment of the objectives. For animal health, project activities were expected to produce outputs such as a policy and legal framework meeting World Organization for Animal Health standards; reduced time for reporting suspected infections; a higher proportion of veterinary staff trained in awareness raising, monitoring, sampling, safety and test procedures; and a higher percentage of veterinary facilities meeting World Organization for Animal Health standards for diagnostic laboratories. These, reinforced by the social mobilization and strategic communications strategies supported by the project, were intended to lead to strengthened animal disease control and awareness, more effective prevention policies and systems, improved disease information systems, availability of essential equipment and reagents in diagnostic laboratories, and augmented bio-security measures in farms and markets. If, despite all these efforts further disease outbreaks occurred in the future, project outputs were expected to facilitate faster identification of, and response to, such infections, and their control and geographic containment.

2.25 The project activities focused primarily on avian influenza (on the animal health side) and influenza of various strains (on the human health side) rather than other zoonoses or other infectious disease emergencies. Training programs, communication programs, laboratory test kits and reagents, vaccination programs and antivirus stockpiles were only designed to address influenza. But some activities would still have contributed to reducing the risks from other diseases by improving mobility of veterinary services, providing laboratory equipment that could be used to diagnose other diseases (if training and reagents were provided), and by setting up surveillance systems and institutions that could be later expanded to incorporate other diseases.

2.26 There was an inherent tension in the project design between the emergency nature of the project and the need to build long-term capacity by supporting complicated laboratory upgrades. The three-year time frame of the emergency instrument was unrealistic for ensuring achievement of some longer-term capacity-building goals, given the technically challenging nature of many procurement and civil works activities (particularly the BSL 3 laboratory). In hindsight, questions might be asked as to whether some highly technical works and equipment procurement activities that would have been better funded through a standard investment loan. However, no suitable project was in the Bank's lending pipeline at the time of appraisal, and these activities were an important part of a comprehensive response to avian influenza. It was impossible to know for how long the wave of outbreaks would continue at the time of design and appraisal, so including activities with a longer time horizon was a reasonable component of the original project design.

2.27 An impact evaluation of the project by the International Livestock Research Institute (ILRI) found that the project design did not include sufficient engagement with the private poultry sector industry³, and that it devoted insufficient financial support to producing analytical epidemiological studies in the animal health sector⁴ (ILRI 2011). Engaging with the poultry sector might have increased reporting incentives (particularly for transporters and traders who were excluded from the compensation mechanism), and increasing epidemiological capacity might have improved the ability to identify and contain outbreaks. Both of these could have contributed to minimizing the risk posed by avian influenza.

2.28 The relevance of design is rated *Substantial*.

3. Implementation

3.1 To respond rapidly to the Government's urgent request for assistance, the project was prepared under the Bank's emergency guidelines (OP/BP 8.50). The project was appraised in February 2006, approved in March 2006, and became effective in June 2006. It was originally designed to close in June 2009, but following the Mid-Term Review in May 2008, the closing date was extended by 18 months to December 31, 2010. Only two outbreaks had occurred after 2007 (the last in August 2008), so these extensions were primarily to enable a number of activities to be completed, in particular the setting up of medical and veterinary diagnostic laboratories and piloting of four model live bird markets (later extended to 15 markets to use funds originally slated for compensation). However, these activities were still not completed by the new closing date, and in December 2010, a further five-month extension was granted until May 31, 2011.

3.2 The proposed project cost of US\$ 62.2 million was to be financed by an IDA Credit of US\$50 million equivalent, plus an additional US\$12.2 million reallocated from two ongoing IDA-supported projects, the Second National Fadama Development Project implemented by the Federal Ministry of Agriculture and Rural Development, and the Second Health System Development Project, implemented by the Federal Ministry of Health. Of these funds, \$1.9 million were provided as quick-start funds that were disbursed before the Project became effective. Bank staff reported that there were no adverse consequences for the Fadama II or Health Systems Development II projects from these reallocations (as these projects did not use their full allocations), and that Project activities supported by these funds were consistent with the objectives of those projects.

³ A lack of early engagement with poultry farmers contributed to initial compensation rates being set too low (which may have inhibited disease reporting), and the project interacted mostly with farmers and did relatively little to engage with the rest of the poultry value chain, and so may have missed an opportunity to reduce the risk of disease spread through poultry transporters and traders.

⁴ The project relied on the existing information management system for animal health rather than investing further in these, which meant that animal health epidemiological capacity did not advance under the project. This may have missed an opportunity to improve reporting of avian influenza and other zoonoses, which could have contributed to risk reduction.

Planned vs. Actual Expenditure by Component

3.3 At project closure, total expenditure stood at US\$49.90 million, about 20 percent less than the appraised cost of US\$62.20 million. As seen in the table below, the animal health component cost US\$2.5 million less than foreseen, largely because the planned BSL3 laboratory at Vom had not been procured by the time the project closed, and was subsequently financed by Federal Government from its own resources. The human health and communications components came out close to original estimates. Project management costs were largely integrated into individual components rather than accounted for in a separate component. Only \$1.9 million of the US\$12.2 million nominally reallocated from the Fadama II and Health Systems II projects was used, whereas US\$48 million of the US\$ 50 million IDA Credit was utilized by the time the project closed.

Table 2: Project Cost by Component (US\$ million)

COMPONENT	APPRAISAL ESTIMATE (US\$ M)	ACTUAL EXPENDITURE (US\$ M)			PERCENTAGE OF APPRAISAL
		NAICP	Other*	Total	
Animal Health	29.20	26.08	0.70	26.78	91.71
Human Health	18.25	16.97	1.20	18.17	99.56
Social Mobilization and Strategic Communications	4.08	4.00		4.00	98.04
Implementation Support and M&E**	6.89	0.95		0.95	13.79
Total Baseline Cost	58.42	48.00	1.90	49.90	85.42
Physical Contingencies	0.95	0.00		0.00	-
Price Contingencies	2.83	0.00		0.00	-
Total Project Costs	62.20	48.00	1.90	49.90	80.22

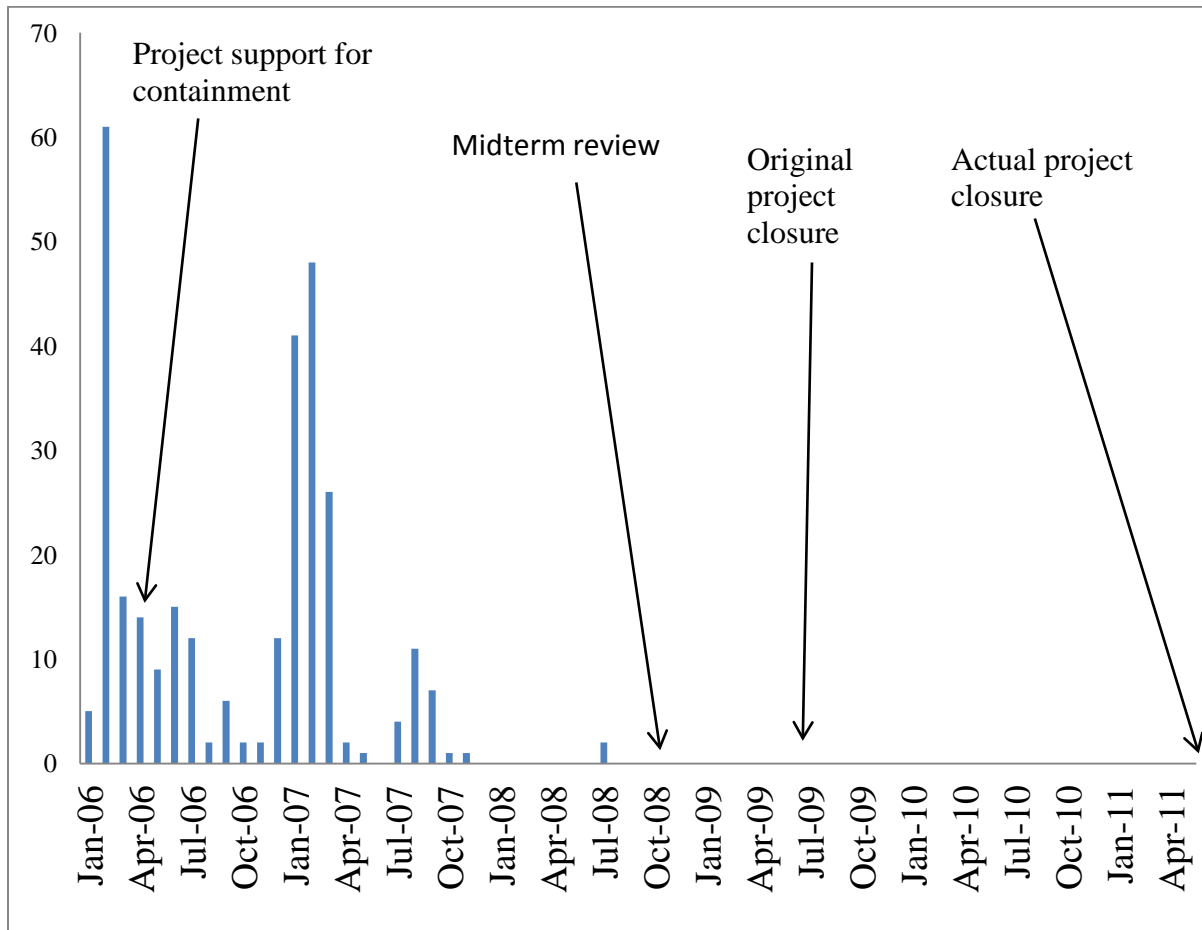
Source: World Bank (2011), p. 21

*"Other" consists of US\$ 0.7 million from Fadama II and US\$ 1.2 million from HSDP II.

**Most of the US\$ 6.89 million was reallocated to the Animal Health and Human Health Components.

Implementation Experience

3.4 Early implementation prior to formal effectiveness was assisted through use of the established project management units for the Fadama II and Health Systems Development II projects, and by having access to funds in their Special Accounts. By the time the project became effective in June 2006, dozens of avian influenza outbreaks had occurred and disease diagnosis and poultry culling had begun, with support from the project. The containment program that followed was successful, with most outbreaks having been contained by April 2007, fifteen months after they started (Figure 1). The project played a major role in this success, though support was also received from UN agencies such as FAO, UNICEF, and WHO, and bilateral donors, particularly USAID and the United States Centers for Disease Control and Prevention.

Figure 1: Number of HPAI Outbreaks and Project timeline

Source: Project documentation.

Note: During the period between April 2006 and the mid-term review in October 2008, the project provided support for culling operations, compensation, training, vehicles, communications, disinfection, and surveillance. There was no domestic human HPAI diagnostic capability and animal health diagnostic capacity was limited to one site at the National Veterinary Research Institute.

3.5 Following successful containment of the initial outbreaks, implementation slowed after March 2007 as the project became a lower priority. Weaknesses in procurement contributed to a lack of progress on civil works and equipment purchases for the BSL2 veterinary teaching hospital laboratories or the BSL 3 laboratory. The M&E system was not adequately measuring progress, in part because of the lack of a designated M&E specialist.

3.6 At the Mid-Term Review in May 2008, considerable funds that had been budgeted for the compensation and livelihoods support activity were unspent, and a decision was made to reallocate these to other activities, rather than to have them remain unused. Some activities were also further decentralized, as there had not been sufficient delegation to the state and local levels.

3.7 To accommodate slow procurement and adjustments after the Mid-Term Review the project was extended twice, through May 2011. Even with these extensions, procurement

was slow. A decision was made to drop plans to upgrade an existing site for the BSL 3 laboratory, and instead to purchase a modular laboratory. Eighty days before project closure, procurement had still not been completed for this modular lab. The Bank decided that the lab could not be completed by project closure and declined to give clearance. By the time the project closed in May 2011, the modular BSL3 laboratory had not been procured, and despite procurement being well advanced, few of the fifteen live bird markets and none the upgraded laboratories at the five veterinary teaching hospital laboratories were operational.

3.8 Some planned activities were not implemented. Though the compensation mechanism worked well, no support for vulnerable groups or livelihood support was carried out, except for traders who benefited from live bird markets. The poultry vaccination campaign included in the design of the animal health component was not carried out; a decision was made by the government that since the stamping out program was showing success, vaccination would be an unnecessary expense and would make surveillance more difficult, as vaccinated birds can trigger false positives in diagnostic tests. This decision had widespread support from veterinarians and other experts within Nigeria.

IMPLEMENTATION OF MONITORING AND EVALUATION

3.9 The Knowledge, Attitudes, and Practice surveys conducted under the project successfully demonstrated a dramatic increase in awareness of avian influenza and plausibly demonstrated the project's role in this. But the surveys did not always ask questions about the behavior of respondents, and so could not assess whether the communications campaign had been successful in changing behavior (and thus reducing the risk of disease spread) for all groups.

3.10 Early in the project, the M&E system performed poorly in collecting data and reporting quantitative information. The system improved over time, particularly after the Mid-Term Review, when a dedicated M&E specialist was appointed and 10 additional indicators were added. But the avian influenza outbreaks were over by then, and much of the remaining project activities focused on civil works, so the M&E system was of modest value during the most important part of the project.

3.11 The system was effective in verifying that training activities had taken place, improvements in sample diagnostic time had been realized, plans and studies had been created, and other forms of output were tracked. But though designed to track whether intermediate outcomes were being achieved (such as the ability of laboratories to perform diagnostic tests), the claims of the system were not always accurate. For example, an indicator reported that all six veterinary laboratories were capable of performing diagnostic tests, when most of these laboratories were not operational as of project closure.

3.12 Though not part of the formal monitoring and evaluation system, the project supported an intensive impact evaluation study by the International Livestock Research Institute (ILRI 2011).

SAFEGUARDS ISSUES

3.13 The project was assigned environmental safeguard category B, mainly due to the need for safe disposal of carcasses from culling operations and for management of medical and veterinary laboratory wastes. Because of the emergency nature of the project, environmental plans were not prepared prior to project effectiveness, but plans were created and approved prior to commencement of any civil works. A Medical Waste Management Plan covered laboratories, clinics and hospitals and an Environmental Management Plan covered carcass disposal at culling sites and waste disposal at live bird markets. The plans were revised and upgraded based on experience gained during the outbreaks in 2006 and 2007. Livestock officers and health workers received training on preparation and implementation of the plans.

3.14 While the management plans were followed broadly, evidence from IEG mission interviews suggested that there were a few cases where the plans were not followed because they were unrealistic given local conditions. Full body protective clothing could not always be used by workers operating for many hours outdoors in hot temperatures. Digging pits for carcasses was not feasible in areas where the water table was very high, so in some cases carcasses were burned instead. And culling poultry by using gas in a contained bag was sometimes infeasible given the large numbers of birds culled and the permeability of bags. This suggests that the initial Environmental Management Plan was not sufficiently adapted to the local context. An independent safeguard audit conducted by local consultants did not raise any compliance issues.

FINANCIAL MANAGEMENT AND PROCUREMENT

3.15 No major issues with fiduciary performance were reported, and external audit reports were delivered on time and were unqualified. The Animal Health and Human Health components each maintained their own special account (the Animal Health component also facilitating funds for the Communications component), and had adequate fund flow arrangements.

3.16 The project suffered from significant procurement delays throughout implementation, particularly for civil works and equipment for the medical and veterinary health laboratories. While the project management unit was able to acquire some staff from the existing Fadama II and Health Systems Development II projects, there was still insufficient familiarity by the procurement unit with World Bank procedures. An inability to procure the BSL 3 laboratory at the National Veterinary Research Institute in Vom even after two project extensions meant that this activity ended up being financed from the Federal Government's own resources after the project closed, despite the fact that there were sufficient funds still available in the project at closure.

3.17 Procurement was inherently complex, because of the highly technical nature of some items to be procured, and because of the multi-state, multi-ministry, and multi-agency nature of the project. Procurement functions were centralized in the animal health and human health project management units. There did not appear to have been sufficient communication between the central procurement in Abuja and the end users elsewhere in Nigeria in terms of design and procurement supervision. The IEG mission found a number

of examples where end users felt that their specific needs had not been met in terms of the design of civil works or selection of equipment (sometimes leading to redundancies or gaps). Some agencies reported that the centralized procurement function and their consultants appeared to have paid suppliers in full without consulting the end users to check that contractual obligations had been met, which was problematic in cases where works were sub-standard or shipments were missing key equipment.

4. Achievement of the Objectives

Minimize the threat posed to the poultry industry and humans by HPAI infection and other zoonoses

4.1 A number of preparedness planning steps had been carried out by the Nigerian government before the project began. A contingency plan was in place by November 2005, just before the first HPAI outbreaks occurred in January 2006. An Incident Response crisis center in the President's office was established immediately following the initial outbreaks, (and remained in force until 2007) and inter-ministerial committees formed with wide stakeholder participation to manage the containment exercise and increase public awareness to the risks of the disease. The World Bank was represented on these committees, as were other development, health, and agriculture agencies. A communication strategy did not feature prominently in the original 2005 HPAI Comprehensive Plan, but some communication activities were started following outbreaks in early 2006.

4.2 Prior to the avian influenza outbreaks, there was only limited animal disease surveillance operating in the country, through the National Animal Disease Information System (NADIS). This was an initiative fostered under the Pan African Program for the Control of Epizootics, which also established the Epidemiology Unit in the Federal Ministry of Agriculture, which ultimately provided the basic structure for HPAI surveillance. A limited number of surveillance officers monitored only potential hotspots such as markets, abattoirs, airports, border crossings, and ports.

OUTPUTS

4.3 **Preparedness planning and training.** The Project supported a range of preparedness planning and training activities. By January 2007, all 36 states and the Federal Capital Territory had developed and adopted HPAI preparedness and response plans. By September 2009, more than two and a half years later, a total of 44 veterinary policy guidelines and pieces of legislation meeting World Organization of Animal Health (OIE) standards had been approved in all states and the Federal Capital Territory. These state policies were derived from the Federal Animal Disease Control Act (1988), State Meat Hygiene Edicts (1969), and the Veterinary Surgeons Act (1987). A total of 6,709 veterinarians and para-vets (against a project target of 4,604) were trained in awareness raising, disease monitoring and

investigation, sampling techniques, and safety and testing procedures.⁵ About 90 percent of those trained were in the private sector, and about 80 percent were based in rural areas. In addition, about 4,500 health workers and poultry farmers in at-risk situations were trained to adopt preventive measures to protect them from the disease.

4.4 Response plans supported under the project were followed in conducting containment of avian influenza outbreaks. Training was important in building capacity to respond to outbreaks. The IEG mission was informed by a range of stakeholders that training programs were of high quality, though there were no objective measures available of the quality of instruction or the extent to which capacity was actually built.

4.5 **Communication.** The initial communication messages at the time of the first outbreaks⁶ were somewhat alarmist, implying that eating poultry meat and eggs should be avoided.⁷ This likely contributed to a collapse in demand for these products; industry estimates were that demand fell by about 80 percent by mid 2006, and production did not return to pre-outbreak levels until 2010. However, market prices were also affected by broader public concerns about the avian influenza outbreaks, and it is not possible to distinguish between these two factors.

4.6 Recognizing that the initial communication strategy was flawed, the government responded quickly by forming (with project support) the National Pandemic Enlightenment Committee, actively involving UNICEF, the International Organization for Migration, WHO, FAO, Red Cross, the Ministry of Education, and the Poultry Association of Nigeria, along with the Federal Ministries of Agriculture, Health, and Information. The involvement of all stakeholders (including producers and consumers) in the development of a new strategy ensured that future messages raised awareness of the risks of HPAI in a more balanced fashion and explained more clearly what producers and consumers needed to do to protect themselves and minimize disease spread, without causing unnecessary economic damage to producers whose flocks were disease free.

4.7 The strategy was implemented by the Federal Ministry of Information and Communications over 2006-11. Communications Desk officers were identified in all 774 Local Government Authorities, which were provided equipment such as projectors and computers, given appropriate training, and issued with Standard Operational Procedures.

4.8 The project conducted workshops with mass media stakeholders from all states, including radio and TV organizations and editors of newspapers. Over 5,000 media kits were produced and a logo and website (www.AICPNIGERIA.org) were developed. Awareness programs started on TV and radio, with regular briefings given from the Crisis Centre.

⁵ The 6,709 veterinary staff trained represents 102% of the number of registered veterinary staff in Nigeria. This result is possible because turnover and attrition in staff. In any case, nearly all veterinary staff were covered by the training program.

⁶ These messages occurred after project approval and during the period where the project was using funds from the Fadama II and HSDP II projects, but before formal effectiveness of the Avian Influenza project.

⁷ These messages were inaccurate, since there is no risk of transmission from consumption of properly cooked poultry and eggs.

4.9 Communications programs were designed to increase awareness of HPAI, change behavior (such as to improve handling of birds and carcasses), and encourage reporting of disease outbreaks. The awareness program faced several challenges, including low access of the poor to media, the need to communicate in 150 languages, customs and traditions (some sprinkle blood of a chicken on the newborn child), a porous border with six countries, and large semi-nomadic groups. To address these challenges, the strategy devised messages and products targeted at particular audiences, which were delivered in local languages and directed to those states and groups considered to face high risks, including poultry farmers and sellers. Communications staff reported that radio jingles were the most effective at raising awareness in terms of cost and rural audience coverage. The project supported production and airing of 259 jingles in 24 languages/dialects, slightly below the target of 295 jingles in 31 languages/dialects, because production costs were higher than expected. Television and radio documentaries were produced and aired. The project also produced posters, t-shirts, magazines, aprons, and other materials. Over 2006-8, communication messages were harmonized through workshops held every six months, involving all stakeholders including producers, traders and consumers.

4.10 After the outbreaks ceased in mid-2008, the intensity of public awareness campaigns decreased. From 2009, the project conducted annual forums⁸ to discuss communication strategy in each of the six geopolitical zones in the country. With less budget available, increased targeting of radio and use of posters in schools, hospitals, and motor parks have been used. Up to 2011, full time state communication desk officers were training the part-time local government officers.

4.11 **Disease surveillance and diagnosis.** Following the outbreaks, the surveillance manpower was increased dramatically, with 34 specific avian influenza desk officers nominated at the state level and 774 desk officers at the LGA level. LGA desk officers reported disease status information to state desk officers during active outbreak periods. Highly Pathogenic Avian Influenza was added to the National Animal Disease Information and Surveillance system, which was expanded from 295 local government areas to cover all 774 areas. This passive surveillance⁹ system provides monthly updates compiled by state level surveillance officers based on reports from roughly 500 local area veterinary officers, and still operated at the end of the project (and during the 2012 IEG mission).

4.12 All commercial and semi-commercial poultry farms (those with at least 200 birds) were registered with the Ministries of Agriculture using GPS devices procured under the project, and were required to report disease outbreaks through the desk officer system. The project financed purchase of 52 pick-up trucks for state desk offices and veterinary teaching hospitals, and 908 motorcycles for local government agency desk officers and quarantine services, which increased capacity to conduct surveillance, communications, and outbreak containment.

⁸ Assisted by FAO, the International Organization for Migration (IOM), USAID, and the CDC.

⁹ Passive surveillance is routine reporting of disease cases reaching health care facilities (for human or animal health), and does not involve any special efforts to find unsuspected disease cases, and so reservoirs of disease may remain undiscovered.

4.13 The project financed a range of surveillance studies, including a World Organization for Animal Health assessment of the performance of veterinary services (August 2007), research in migratory and resident wild birds (January 2009), and a wetland duck study by the University of Jos Biological Conservatory and A. P. Leventis Ornithological Research Institute (May 2011). With technical support from the FAO, the project surveyed resident wild birds in the vicinity of avian influenza-infected poultry farms in six states,¹⁰ and conducted a nationwide active surveillance survey in March 2007¹¹ and targeted disease surveillance studies at live bird markets in all states over 2007-8.¹² Additional surveillance surveys were carried out by the FAO without project support. But there was no active surveillance of poultry after 2010 or any ongoing surveillance of wild bird populations.

4.14 Under the project, six laboratories (the laboratories at five veterinary teaching hospitals and at the National Veterinary Research Institute in Vom) were to be renovated and equipped to diagnose HPAI. The IEG mission found that while civil works were carried out and equipment and reagents procured, the project-supported upgrades at two of the five veterinary teaching hospital laboratories (in Abeokuta and Maiduguri) were not operational as of November 2012 due to missing equipment and some poor quality civil works.¹³ The upgrades at the other three (in Nsukka, Zaria, and Sokoto) were not operational as of project closure and were reported by the Federal Ministry of Agriculture to be “partially operational” by June 2012.¹⁴ Thus, the investments in Veterinary Teaching Hospital laboratories had no impact during the outbreaks, because of the difficulties in making the laboratories operational.

4.15 The project supplied training, equipment, and reagent purchases for the National Veterinary Research Institute in Vom. The Institute was the only laboratory capable of diagnosing HPAI in animal samples throughout the period of the outbreaks, and was effective in doing so.¹⁵ With FAO assistance, a system to expedite the transfer of samples from the field to the Vom laboratory was developed, with cooperation of truckers organized through their Transport Association, including a telephone hotline from the truck park to the lab to facilitate sample pick-ups. But plans to upgrade the Institute’s laboratory to BSL 3

¹⁰ The survey collected 587 samples from 44 species in Borno, Kaduna, Kano, Ogun, Plateau, and Yobe States and analyzed them at the National Veterinary Research Institute.

¹¹ Active surveillance involves a program where samples are taken from animals or humans that do not display symptoms or have not reported to a health facility, and so can potentially discover disease among the general population.

¹² The Federal Capital Territory and all 25 states where outbreaks occurred were surveyed in November 2007, and the remaining 11 states were surveyed in June 2008.

¹³ Some specialized refrigeration equipment was procured centrally but was never delivered to the laboratories, and the remaining equipment was not installed because of defective benchwork.

¹⁴ In contrast, the Bank’s completion report claimed that the veterinary hospital laboratories had been commissioned in May 2011 (World Bank 2011, page 24). In March 2013 the World Bank reported that all five laboratory upgrades were fully operational, but this has not been independently confirmed by IEG.

¹⁵ The Institute accurately diagnosed all outbreaks that occurred in Nigeria. The laboratory was certified by the World Organization for Animal Health as capable of carrying out 13 of 13 diagnostic activities for highly pathogenic avian influenza.

were dropped due to difficulties with procurement.¹⁶

4.16 Stamping out and Compensation. The project supported “stamping out” operations to contain outbreaks through creation of the network of desk officers, the provision of training, and the supply of safety equipment, disinfectant, and vehicles. It facilitated strong cooperation between the three implementing Ministries. Desk officers from each component jointly supervised culling operations and conducted communication and outreach efforts with nearby farmers and villagers, and conducted human health checks on farm workers.

4.17 Stamping out operations contain the spread of disease by killing birds that may have been exposed and could be infectious. During the project, roughly 754,000 birds were identified as having died from influenza, while roughly 1.26 million birds were culled during stamping out operations, and 118,000 eggs were destroyed. Carcasses, feed and eggs were buried in pits.

4.18 A mechanism was established to compensate poultry farmers for birds culled during operations but not for birds that died from disease. This encouraged farmers to report outbreaks promptly, before further birds died, but also reduced the effective compensation rate since many birds died from avian influenza before culling operations began¹⁷. In total, 3,037 poultry farmers (of whom 24 percent were women) across 384 farms were affected directly by the culling and received in compensation at least Naira 577 million, equivalent to approximately US\$5 million. Of these payments, Naira 145 million in compensation payments were financed by the Federal Government for outbreaks that occurred in early 2006 before project effectiveness, and Naira 430 million in payments were financed by the project. Most affected farms were small commercial farms with 200-1,999 birds, but most dead and culled birds were from medium scale commercial farms (Table 3). The project-supported registration of commercial farms assisted in the verification and processing of compensation claims. But only registered farmers were eligible for compensation;¹⁸ traders and transporters were excluded from the scheme. Potentially this could have discouraged traders from reporting signs of sickness, which was a weakness in the system.

4.19 According to IEG mission interviews and other sources, the compensation process was transparent. The names of recipients and the amount of compensation paid to each were disclosed in newspaper advertisements and on the project website, as well as within the communities. Initial compensation payments at flat rate of Naira 250 per bird were considered insufficient by poultry farmers, but in consultation with the industry association (the Poultry Association of Nigeria) and others, this was later increased to a higher variable

¹⁶ After the project closed, the Federal Government provided funds to purchase a modular BSL 3 laboratory (rather than upgrading existing facilities), and this became operational in mid 2012. The lab in theory can prevent the need for international testing of samples and cutting the time needed for confirming diagnoses and identifying influenza subtypes. However, in the absence of the disease in Nigeria, it has not been used for testing HPAI samples, but is being used for testing samples for swine fever and rift valley fever.

¹⁷ For 61% of affected farms the number of bird deaths from avian influenza (and so not eligible for compensation) exceeded the number of birds culled.

¹⁸ Very small backyard farms with less than 200 birds were not registered and so were also excluded from the scheme.

rate considered satisfactory by farmers based on the type/species of bird and their production stage. On average, by the time the stamping out operation had ended, the average compensation paid was approximately Naira 500 per bird, double the original rate.¹⁹ The Bank required verification of losses by independent financial consultants and approval by Bank financial management processes before compensation was paid out. While this may have helped to ensure good governance and transparency, it also contributed to significant delays between outbreak notification and payment processing.²⁰ However, there was no evidence that these delays reduced reporting of outbreaks by farmers.

Table 3: HPAI Outbreaks and Compensation by Farm Size, 2006-2008

Farm size	Farms affected	Poultry Deaths from HPAI	Poultry Deaths from culling	Compensation paid (₦)
Large scale commercial (20,000+ birds)	10	672,923	325,968	190,206,430
Medium scale commercial (2,000 - 19,999)	104	490,849	489,560	293,785,170
Small scale and backyard (200-1,999)	273	119,039	155,503	93,004,800
Total:	387	1,282,811	971,031	576,996,400

Source: Nigeria Avian Influenza Control Project.

Note: The table includes some outbreaks that occurred before the project was operational.

4.20 The avian influenza outbreaks and the collapse in poultry and egg prices (by as much as 80%) caused significant economic losses and hardship for poor farmers. The appraisal document for the project noted that the compensation and economic recovery subcomponent would also include support to economically vulnerable groups and alternative livelihoods for affected stakeholders.²¹ However, no attempts were made to support these activities other than through the live bird markets. It is unclear why these planned activities were not undertaken, particularly given that not all funds allocated for compensation were needed for that purpose.

4.21 **Biosecurity on farms, at borders, and in markets.** Before the HPAI outbreaks began, farm biosecurity was limited except on the larger commercial farms. Under the

¹⁹ The original rate of 250 Naira per bird was arbitrary. Rates under the variable system were aimed at having a compensation rate that was roughly 70% of the market value of birds, so as to provide significant compensation that could support restocking but without encouraging over-reporting.

²⁰ The IEG mission received mixed reports on the extent of delays.

²¹ The Technical Annex appraisal document noted that the activity would provide “support to low income groups...through...improving animal health services at the community level, and providing grants for additional compensation. This includes the development of pro-poor exit strategies, including livelihood diversification.” It would also “support smallholder poultry farmers in a bottom-up demand, driven and equitable manner to resume poultry farming or undertake a different livelihood, based on demand-driven proposals made by stakeholders. The Project will provide: a) advisory services that will support new investment or restocking activities ... and b) seed money, through a credit mechanism yet to be decided, to eligible stakeholders...” Source: World Bank (2006), page 16-17.

project, roughly 8,000 commercial and semi-commercial poultry farmers (nearly all of the 8,238 farms registered by the project) received some training on basic safe animal handling and other biosecurity measures, including restricting farm access to employees only, installing disinfecting sheds, removing ducks from chicken farms, and installing foot and wheel dips at farm gates.²² The project financed purchase and use of disinfectant at major bird markets, and at border control posts for vehicle spraying. While there is no quantitative data on adoption of these measures, there were reports that adoption was widespread during the 2006-8 outbreaks. The Bank's project completion report claims that all 8,283 farms registered by the project are biosecure, but this was impossible to verify.²³

4.22 The project also provided motorcycles, boats, building renovations, and training to four quarantine stations. However, importation of poultry was already illegal in Nigeria prior to the project, so any bird imports were not legally passing through quarantine checkpoints. The large porous borders of Nigeria and the limited capacity of the quarantine service make it infeasible to interdict illegal imports. So the modest support provided to the quarantine services by the project likely had negligible impact on the transport of birds and thus on the risks posed by avian influenza. There was no communication component that sensitized border communities to the risks of poultry importation and encouraged them to refuse access. Quarantine stations were left to do this work on their own, but had few resources with which to accomplish this.

4.23 At the Mid-Term Review in May 2008 the project added pilot activities to construct four live bird markets. Based on early successes, the targeted number was later increased to 15, and 14 markets were constructed during the project, of which 8 were operational by November 2012.²⁴ These markets improved poultry trader incomes at selected sites and may have had some impact on biosecurity at those sites, but had little aggregate impact on biosecurity in Nigeria (Box 1).

OUTCOMES

4.24 Three hundred outbreaks of HPAI in poultry were identified and contained in Nigeria between January 2006 and August 2008, of which 270 occurred after project effectiveness in June 2006.²⁵ The outbreaks led to the death of roughly 2 million birds, of which about 754,000 died from disease and 1.26 million were culled. There was a single confirmed human fatality. A 2010 Gap Analysis Report by the World Organization for Animal Health (OIE 2010) found that HPAI was under control in Nigeria. Nigeria appears to be on track to receive certification of HPAI-free status.

²² Very small or backyard poultry farmers were not trained under the project.

²³ No criteria are given for being biosecure, and no evidence was collected on actual implementation of biosecurity measures.

²⁴ The World Bank reports that 12 of 14 markets were operational as of March 2013. This has not been independently confirmed by IEG.

²⁵ The Project was still able to make some emergency purchases to assist in outbreak control prior to project effectiveness, because of the use of funds from the Fadama II and Health Systems Development II projects.

Box 1: Biosecurity of Live Bird Markets

Based on promising results from the Bank-financed Avian Influenza Project in Vietnam, the Nigeria Avian Influenza Control Project supported construction of upgraded live bird markets with improved biosecurity. In typical markets, birds of all ages and ducks are kept in cramped cages, there is no facility to wash down or disinfect the areas, and the slaughter areas and system of waste disposal are unsanitary. The new markets had better biosecurity than the traditional markets because there were dedicated areas that could be hosed off and disinfected, allowed only one-way flow of buyers through the building, had more cage space that allowed segregation of birds by age, had clean slaughtering for dressing poultry, and had a better system for waste disposal. Traders at these live bird markets also had access to new plastic transport cages that were more easily disinfected.

Local traders who operate these markets, organized in local Fowl Sellers Associations, were enthusiastic about the markets, and agreed to contribute 15 percent of the construction cost from their own resources. They were granted full ownership of the markets upon completion. While 14 of the 15 planned markets were constructed,^a only eight of the markets were fully operational as of November 2012. Two more were partially functioning, one was expected to become functional, and three had been built but had issues that may not be resolved in the short term (security, community problems etc.). Biosecurity was improved and trader incomes increased at the operational live bird markets constructed under the project as sales increased significantly at the more spacious and clean locations. An analysis of the market at Kaduna estimated a rate of return of 34 percent based on dramatic increases in sales (ILRI 2011).^b The markets also led to an increase in the proportion of live birds slaughtered and dressed at the market, rather than being taken home to be slaughtered, which reduced the risk of disease spread from markets to household poultry.

But a lack of replication and scale up meant that the overall impact on market biosecurity was negligible at the national level. Roughly 80-85 percent of poultry sales occur at farms, rather than at live bird markets. The 14 markets established under the project cover an insignificant proportion of national live bird market throughputs. Though the number of markets nationwide was not available, the two markets visited by IEG represented one of seven markets in Abeokuta and one of 207 markets in Lagos.

Traders, consumers and state governments are all very enthusiastic about the new markets, but despite this support and public, high profile commissioning of all the markets, no additional markets have been built outside those funded by the Project and two financed by the Federal Ministry of Agriculture during the project period. The high cost of the markets (about US\$140,000 each) is beyond the means of fowl sellers' associations to finance, and so scaling up of this initiative will not occur without external funding, such as through a project or from state governments.

a. Construction of one market did not proceed because of issues in securing the land.

b. This large return is driven in part by customers switching from other markets nearby to the upgraded market, and does not necessarily imply that high returns could be obtained from investing in large numbers of markets in the same area. But the return estimate comes solely from financial benefits to traders, ignoring benefits from improved biosecurity and public health, and so understates potential benefits.

4.25 An independent impact evaluation conducted by the International Livestock Research Institute noted that insufficient direct evidence was available to assess the degree to which the project was responsible for reducing the spread of avian influenza, minimizing the threats of avian influenza to humans, or eradicating the disease from Nigeria (ILRI 2011). Given the difficulties in establishing a counterfactual, it is hard to see how such evidence could have

been generated. However, evidence on intermediate outcomes stemming from the project's investments suggests areas in which it plausibly could have made a significant contribution. It is also reasonable to attribute observed gains to the project, since the majority of avian influenza control measures being supported in Nigeria were taken under the auspices of the project.

4.26 As the activities supported by the project were focused on avian influenza, which was the source of the emergency, the project did relatively little specifically to minimize the risk from other zoonoses. However, improvements in disease surveillance systems, mobility for veterinary services officers, and diagnostic capacity have likely provided some benefits to detection and response of other zoonoses.

4.27 **Awareness and behavior.** Communications activities carried out by the project were reported to be effective in raising awareness of avian influenza, but there is limited formal evidence for these claims. Knowledge, Attitude and Practice (KAP) surveys supported by UNICEF surveyed 3,450 adults across 12 states (Firstfruit Consulting, 2011). The surveys found high levels of awareness of avian influenza and basic preventative measures: 87 percent of respondents had heard of avian influenza, 85 percent were aware of avian influenza symptoms in birds, and 71 percent thought that transporting birds and humans in the same vehicle would increase the risk of disease exposure. The surveys also suggested high levels of awareness of communications material supported by the project: 91 percent had heard about avian influenza by radio, 86 percent by television, 84 percent by print media, and 72 percent by live bird and other markets.

4.28 But it is difficult to assess project impact from this survey. No baseline level could be established prior to project implementation given the rapid preparation. A baseline survey was not published until December 2007 (Environquest 2007), and it noted that 40.2 percent of respondents first heard of avian influenza in 2005 while 46.1 percent heard of it in 2006, and that high awareness levels were likely due to information dissemination.²⁶ The baseline survey and final survey asked different sets of questions and so were difficult to compare. The surveys also focused on awareness rather than on behaviors, so do not allow direct assessment of behavioral change. The KAP survey included focus group discussions with 325 people which did ask about behavioral practices, and found that a majority of discussants claimed that they followed advice contained in messages received on avian influenza, but there was no baseline to compare this to. Thirty detailed interviews were also conducted; in 16 of them respondents reported having heard contradictory messages, particularly on whether or not it was safe to consume chicken.

4.29 **Surveillance, diagnostic capacity, and containment of outbreaks.** Disease reporting from private veterinary clinics and commercial farms increased significantly; during the outbreaks, periodic reports on animal health were being submitted by 80 percent of all veterinary clinics and 100 percent of farms in at-risk areas (up from 7.3 percent and 14.5 percent at the start of the project, respectively).

²⁶ Neither the KAP survey nor the baseline survey make clear when their surveys were conducted.

4.30 Streamlining of the diagnostic procedure at the National Veterinary Research Institute laboratory and the expedited transport system for delivery of samples from farm to laboratory led to a reduction in the time between outbreak reporting and initial diagnosis from 7-12 days in December 2007, to one to two days in July 2008. Decentralization of surveillance teams to operate under the State level authorities may also have contributed to the improved diagnostic turnaround (ILRI 2011). Equipment upgrades at the National Veterinary Research Institute laboratory also increased the capacity to diagnose African swine fever and Rift Valley fever.

4.31 An ILRI impact evaluation found that though there were improvements in animal and human health surveillance systems, the surveillance systems pick up only a very small proportion of suspect cases (ILRI 2011). The assessment also notes that much of the credit for increased animal health diagnostic capacity is due to independent initiatives conducted by the National Veterinary Research Institute.

4.32 The stamping out operations conducted under the project almost certainly played a major role in preventing spread of HPAI and in reducing the economic damage from the project. A total of 3,037 poultry farmers (of whom 24 percent were women) were affected directly by the culling and received in compensation Naira 631 million, equivalent to approximately US\$5.4 million. The outbreaks occurred in 25 of the country's 36 states, but were confined to 97 of 774 LGAs in the country (Annex B4). This could indicate that once an outbreak was reported and confirmed in the laboratory, the stamping out operation was fairly effective in containing the spread of disease to neighboring LGAs.

4.33 **Biosecurity on farms, at borders and in markets.** While no quantitative evidence exists on the value of biosecurity improvements, it is plausible that improvements on farms had some impact on reducing the risk of disease spread. Upgrades of quarantine posts and 8 functional live bird markets have not had a significant effect on biosecurity.

4.34 Overall, the efficacy of the project in contributing to achievement of this objective is rated *Substantial*.

Prepare for, control, and respond to influenza pandemics and other infectious disease emergencies in humans

4.35 Prior to the project, surveillance for influenza in Nigeria was very limited, and no pandemic preparedness plans existed at the strategic or operational level until the comprehensive avian influenza plan was established in November 2005. An integrated disease surveillance and response plan existed for several infectious diseases, but did not include avian influenza. A Nigeria Center for Disease Control was established in August 2011. Though this agency will oversee the diagnostic and surveillance systems upgraded by the project, the establishment of the agency was undertaken through the Ministry of Health and was not directly supported by the Project.

OUTPUTS

4.36 **Planning and training.** Broad avian influenza response plans detailing administrative responsibilities for animal and human health aspects were developed and adopted at the national and state level by May 2007. A detailed operational influenza pandemic preparedness and response plan was developed, though it had not been finalized and formally adopted as of November 2012. This operational plan describes specific measures to be undertaken to address a serious pandemic should it occur. The plan recognizes that antiviral medicines and a strain-specific vaccine for humans are unlikely to be widely available, and that a pandemic response would largely rest on physical distancing measures. The draft operational plan has been regularly revised and updated. The integrated disease surveillance and response plan was updated to include avian influenza. A reference hospital and quarantine facilities were designated for each state.

4.37 A total of 2,436 field surveillance personnel and health workers were trained in case management and use of protective equipment. Eight federal response teams were set up to conduct active surveillance in states where HPAI outbreaks had been detected in poultry. HPAI case management guidelines were developed, including plans for use of quarantine and other social distancing measures. Training programs were reportedly effective in improving capacity to identify and respond to influenza outbreaks, but did not address other diseases. Rapid response teams and preparedness plans could be used for other infectious disease emergencies.

4.38 **Diagnosis and surveillance.** The project provided training, equipment, reagents, and civil works to upgrade BSL2 virology laboratories at 8 hospitals, mostly attached to university hospitals. Over 2006-8, a total of 2,500 samples were tested in these laboratories; one tested positive for HPAI. Sixty laboratory personnel were trained to diagnose HPAI. The IEG mission found that in at least one of the university hospitals, civil works financed by the project that were completed in 2010 were not being used as of November 2012, because staff felt they did not meet local requirements.²⁷

4.39 The National Influenza Reference Laboratory in Abuja and 7 regional and zonal laboratories were trained and equipped to conduct reverse transcription polymerase chain reaction tests to diagnose HPAI, and can identify subtyping of the influenza virus. Previously, this capacity existed only at the National Influenza Center in Ibadan (which gained the ability to test a larger number of samples). None of the human health laboratories was upgraded to BSL 3, and so cannot carry out cell cultures. The laboratories were not equipped to carry out diagnosis of other diseases under the Project, but since project closure are being strengthened to carry out diagnosis of other viral diseases such as lassa fever, yellow fever, and West Nile virus using equipment and facilities that were supplied under the project.

²⁷ A new laboratory building at the Department of Virology, University College Hospital, University of Ibadan was completed in August 2010 but was not in use as of November 2012 because it was constructed with open plan rooms, rather than a partitioned environment that could be set up to operate the single-direction workflow system needed for biosecurity when handling virological agents. The department hopes to upgrade the building to use as a special pathogen laboratory, but did not have sufficient funds for the upgrade.

4.40 The project supported creation of active and passive surveillance systems for influenza. The National laboratory in Abuja is the focal point for an active surveillance program that draws samples from four sentinel sites, one in each of four of the six regions in Nigeria. Two regions are not covered. The regional and zonal laboratories are not connected to active surveillance programs, but conduct passive surveillance on an ad hoc basis on samples taken from the hospitals they are attached to and other nearby hospitals. The surveillance systems feed into weekly Integrated Disease System Reports, managed by the Nigeria Center for Disease Control. (See Annex B3 for further details on the surveillance system.)

4.41 **Outbreak response in humans.** During the 2009-10 H1N1 influenza pandemic, the project supported communication strategy was adjusted to focus on steps to reduce influenza transmission between humans, rather than on messages that focused on the risk of transmission from birds of avian influenza. This included messages on how to avoid being infected or infecting others through simple behaviors such as hand washing.

4.42 The project procured a stockpile of 100,000 doses of oseltamivir (also known as Tamiflu), an anti-viral known to be effective in reducing influenza susceptibility and infectiousness. These doses were distributed to targeted hospitals and other health facilities. No health facility was out of stock for more than a week – in part because very few doses were used. Protective equipment was purchased for use by health workers in the event of an infectious disease emergency.

4.43 Roughly 5,000 of 100,000 doses of antiviral were used during the 2009-10 H1N1 pandemic, both for treating infected individuals and prophylactically for vulnerable health workers. The doses of antiviral would likely have been effective in reducing infection rates among health workers and other highly infectious groups had a more serious pandemic arisen during the course of the project. But the bulk of the stockpile expired in 2012, and no plans exist for further purchase, so the long term impact is minimal.²⁸ Rather than procuring a stockpile in a single batch, the project might have been more effective if it had established a system of phased purchase of antiviral, where some doses were delivered each year and where systems were put in place for expiring doses to be removed from shelves and replaced by new doses. While equipment was provided to increase hospital diagnostic capacity, little was done to increase treatment capacity. For example, project funds were not sufficient to cover respiratory intensive care unit equipment in addition to laboratory upgrades.

OUTCOMES

4.44 While a pandemic of HPAI among humans did not materialize, evidence of the extent of preparedness for controlling and responding to influenza pandemics and other infectious disease emergencies in humans comes from intermediate outcomes of project investments, and evidence from the response to the H1N1 influenza pandemic in 2009-10.

²⁸ Rather than procuring a stockpile in a single batch, the project might have been more effective if it had established a system of phased purchase of antiviral, where some doses were delivered each year and where systems were put in place for expiring doses to be removed from shelves and replaced by new doses.

4.45 The feasibility of implementing the HPAI pandemic preparedness plan was verified through a tabletop simulation exercise conducted in October 2011 in partnership with USAID, the National Emergency Management Agency, the United States military Africa Command, the Federal Ministries of Defense and Health, and other Nigerian government agencies.

4.46 During the 2009-10 H1N1 influenza pandemic, some elements of the preparedness plan were used (a small portion of the antiviral stockpile was used), but no major steps were taken (physical distancing measures were not implemented).

4.47 Diagnostic upgrades supported by the project at the National Influenza Reference Laboratory were successful: the laboratory scored 100 percent proficiency in a WHO Global Influenza Surveillance Network quality assurance test (World Bank 2011). Other human health laboratories were not assessed, but were reported as operational.

4.48 Improvements to the surveillance system were demonstrated during the H1N1 pandemic. The human health surveillance system collected 2,803 samples from the four sentinel surveillance sites between April 2009 and August 2010, and these were tested at the National Influenza Reference Laboratory (Dalhatu and others 2012). Of the 2,803 samples, 396 tested positive for any strain of influenza, and 100 tested positive for the pandemic strain of H1N1 (Dalhatu and others 2012). The first samples of the pandemic H1N1 strain were detected in October 2009, and the number of identified samples from this strain peaked in February 2010 and subsided by May 2010, tracking the likely course of the pandemic in Nigeria. Given that estimates of the global infection rate were between 11 and 21 percent (Kelly and others 2011), the system covered only a small proportion of the likely millions of cases, but successfully performed its function in acting as an early warning system, and could probably have been used to trigger pandemic response actions, had the pandemic been more severe. An ILRI assessment (2011) noted, however, that some of the credit for increasing human health diagnostic capacity was due to support from the United States CDC and the WHO undertaken outside the project.

4.49 The effects of the communications campaign on the H1N1 pandemic were not assessed. The use of antiviral may have had a small impact on protecting frontline health workers during the pandemic.

4.50 Overall, the project made a *substantial* contribution to this objective.

5. Efficiency

5.1 It is extremely difficult to estimate the economic benefits of a project such as this. Prospectively, it is hard to estimate the actual chance of outbreaks occurring or their severity. Retrospectively, it is hard to put forward a credible counterfactual. The economic analysis at appraisal identified major sources of potential benefits in reduced poultry losses, human lives saved, and hospitalizations avoided under three scenarios, all of which assumed a severe epidemic (30 percent of unprotected humans would be infected) and very high protective efficacy from the project (33 percent to 100 percent protection rates).

5.2 The economic analysis at closure cites estimates by the Poultry Association of Nigeria indicating that losses from foregone poultry sales and uncompensated mortality totaled about 15.2 billion naira (roughly US\$100 million equivalent) during the year ending February 28, 2007. Fasina, Sirdar, and Bisschop (2008) also estimated the hypothetical financial cost to the poultry industry of uncontrolled HPAI outbreaks at between \$245-700 million.

5.3 While these estimates involve assumptions that are impossible to verify, it is likely that the project provided substantial economic benefits. The cost of the avian influenza outbreaks was high, but costs likely would have been significantly higher without the containment efforts supported by the project, and there may have been additional human mortality and morbidity. As it turned out, the poultry industry did not regain pre-HPAI (2005) levels of production and sales until 2010 (World Bank 2011, page 31).

5.4 In terms of the efficient use of project resources in implementation, it was reported that activities were well coordinated with other international agencies operating in the field and that Ministries collaborated effectively at a technical level with a number of international agencies. Coordination between the three Ministries was also reportedly significant. For example, staff from the three ministries travelled and worked together during outbreak control operations. Significant reductions in sample transport time were made at minimal cost outlay by setting up relationships with transporters such that drivers were confident they would be paid immediately upon sample delivery and were transparently informed of biohazard risks.

5.5 However, initially, key activities, such as surveillance, compensation payments, and communications, were not delegated effectively at the State and local government authority levels. There were significant procurement-related delays throughout implementation. The BSL3 laboratory planned for the National Veterinary Research Institute was not procured until after project closing, using the Government's own funds. Although civil works were complete and equipment was procured, none of the upgraded facilities at the five veterinary teaching hospital diagnostic laboratories were fully operational at project closing (and were still not as of November 2012) due in part to some equipment not being delivered and/or defective works. Even among the laboratories that are now operational, many are largely idle because they are equipped only to test for avian influenza, are not linked to avian influenza surveillance systems, and/or lack sufficient consumable supplies to operate.

5.6 Civil works and equipment purchases were not always efficient: some laboratories received equipment that duplicated what they already had, while equipment they needed was not supplied. A newly constructed laboratory building at the University of Ibadan was still not in use 2 years after construction as staff felt that its design did not meet the needs of the institution. Though 14 live bird markets were constructed, 6 were not operational or were partially operational as of November 2012. The markets faced difficulties such as poor quality construction, demarcation issues and drainage problems, and traders were reluctant to shift to a new site until these problems were addressed. The communication campaign initially had overly alarmist messages, which may have contributed to a collapse in poultry prices and increased the economic costs of the pandemic.

5.7 The Animal Health component suffered from high staff turnover. Coordination was moderately hindered by the decision to locate the Federal Ministry of Health project team in a different location from that of the Federal Ministry of Agriculture and Rural Development and Federal Ministry of Information and Communications teams. The need for a single Project Coordinator to support the three Component Coordinators was not recognized until the midterm review in 2008. Earlier action on this might have helped address the issues with procurement and reduced the need for project extensions.

5.8 Overall, the efficiency of the project is rated *Modest*.

6. Ratings

Outcome

6.1 The Relevance of Objectives was *High* because the project directly addressed the unfolding crisis of an outbreak of HPAI in Nigeria's poultry flocks, which posed severe economic and public health risks. The inclusion of other zoonoses and other infectious diseases was relevant in improving the long-term relevance of the project. The project design followed the general outline of the Global Program on Avian Influenza, addressing the need for assistance in containing outbreaks but also building long term capacity, but did little to address other zoonoses, even once it became clear that avian influenza was contained and the threat of HPAI might be less serious than originally feared. The Relevance of Design was *Substantial*.

6.2 The project made significant contributions to containing avian influenza outbreaks among poultry and improving avian influenza diagnostic and surveillance capacity among animals, but did little to increase capacity to deal with other zoonoses. Achievement of minimizing the threat posed to the poultry industry from avian influenza and other zoonoses was *Substantial*. The project improved preparedness for major infectious disease outbreaks, and improved human health diagnostic and surveillance capacity for avian influenza, but had little impact on the outcomes of the 2009 H1N1 influenza pandemic. Achievement on preparing for and responding to influenza pandemics and other infectious disease emergencies was *Substantial*.

6.3 While the project is likely to have had significant economic benefits, economic rate of return estimates are highly speculative because of the inherent difficulty in identifying a counterfactual. Procurement and other delays significantly slowed implementation, some civil works were not completed by the project even after two extensions, and some laboratory upgrades and live bird markets remain unutilized even 18 months after the project closed. Consequently, the Efficiency of the project was *Modest*.

6.4 Together, these lead to an overall Outcome rating of *Moderately Satisfactory*, due to moderate shortcomings in efficiency.

Risk to Development Outcome

6.5 While the project improved capacity in a number of areas, it is important to maintain this capacity with at least a moderate level of activity, so that systems continue functioning and could be ramped up to a high level of activity if further outbreaks occurred.

6.6 The National Veterinary Research Institute in Vom, the National Influenza Reference Laboratory in Abuja and the National Influenza Center in Ibadan are well functioning institutions and appear highly likely to be sustained.²⁹ But the sustainability of diagnostic capacity in veterinary teaching hospitals (and to a lesser extent at the human regional/zonal laboratories) is at risk. Sustaining this capacity requires a steady work program of sample testing, but this requires an ongoing program of surveillance and sample collection. Laboratories received a number of reagents and other consumable supplies under the project, but lack ongoing funding streams for additional purchases and face difficulties in receiving supplies because of weaknesses in the importation and distribution system. Some veterinary teaching hospital laboratories attached to universities have developed business plans whereby they hope to combine sample testing with their graduate student training programs, but these plans are optimistic in the absence of active surveillance programs that would result in state Ministries of agriculture paying for laboratory services. Sustaining human health laboratories may also be difficult for university budgets to sustain. Universities, hospitals and government agencies will be more likely to be willing to commit the resources needed to maintain laboratories if they were able to test for diseases other than influenza, which would require additional training and equipment.

6.7 There is a risk that human capacity gains achieved will not be sustained, as staff trained under the project change jobs through natural attrition. Desk officer assignments remain in place, but the officers have many responsibilities and spend relatively little time on avian influenza. Funding for training and retraining is limited in the absence of an external project. Public awareness of avian influenza is likely to decline over time without an ongoing communication program. Avian influenza communication activities ended at project closure when funding ceased. After the project closed in 2011, there are no funds for continued training of communication desk officers (apart from very limited externally funded training by organizations such as the UK Royal Institute of Public Administration) or for conducting awareness campaigns.

6.8 The federal government committed funds for two years following project closure to ensure that project activities could be consolidated and mainstreamed into federal and state ministry activities. But most of the first year funding was consumed by the need to procure the BSL 3 laboratory at the National Veterinary Research Institute, which was not completed under the project. The federal health and agriculture ministries have demonstrated willingness to sustain, complete, mainstream and expand project achievements through budget submissions to support continued training, active surveillance programs, additional live bird markets, consolidation of human health laboratories under the Nigeria Center for Disease Control, partially merging the animal and human health surveillance reporting

²⁹ The National Influenza Reference Laboratory has funding from the USA Center for Disease Control until 2016, but there is no funding guarantee beyond 2016.

systems, and other efforts. But as of November 2012, funds for these activities had not yet been confirmed. Many facilities are heavily reliant on donor funds for reagents and other operational needs.

6.9 The National Council on Health passed a resolution in May 2011 to sustain project structures at the State level. The State governments are expected to provide funds to maintain the network of desk officers. But while salaries are paid, there are some reports that budgets are insufficient to cover operational needs to conduct continued training, surveillance, communication and outreach activities. And as time passes without an outbreak or threat of an outbreak, there is a significant risk that budgeted resources might be diverted to other areas of perceived priority.

6.10 It is likely that some biosecurity improvements at larger farms have been retained, and that temporary measures instituted during the outbreaks have subsided, but that biosecurity measures could be reinstated should outbreaks reoccur.

6.11 The Fowl Sellers Associations have undertaken to maintain the live bird markets. The associations benefited significantly from the markets' improved bio-security and food safety measures, which increased sales and economic returns.

6.12 Overall, therefore, the risk to development outcome is *Significant*.

Bank Performance

QUALITY AT ENTRY

6.13 Given the urgency of the situation in Nigeria, with an HPAI outbreak underway, the Bank responded quickly to the borrower's request for financial assistance, using the flexible emergency procedures under Operational Policy 8.50. Moving from concept review to approval took only 6 weeks. The project design incorporated key lessons derived from HPAI projects implemented in Vietnam and the Kyrgyz. These included the need to: ensure high-level political commitment and leadership; adopt a comprehensive, multi-sectoral approach; ensure buy-in from key stakeholders at all levels (particularly in the poultry market chain); develop strong fiduciary arrangements for financial management and procurement.

6.14 Critical risks were identified and appropriate mitigation measures outlined in the Technical Annex. The overall risk rating was substantial, but three risks were rated as high – lack of continuing government commitment to addressing HPAI as a national priority, lack of laboratory capacity for prompt diagnosis, and rivalry between professionals in public institutions. However, the design of M&E systems contained several weaknesses (see page 8).

6.15 There were some weaknesses in project implementation arrangements. The arrangements worked well over 2006-7 while outbreaks were occurring and avian influenza was under scrutiny by the highest levels of government. But problems arose later, when the outbreaks subsided, the poultry culling stopped, and the more mundane tasks of building infrastructure and sustaining surveillance programs were underway. At this stage

implementation slowed considerably, and it was not until a single Project Coordinator was appointed (after the midterm review in October 2008) to coordinate the roles of the three Component Coordinators that implementation progress improved. This raises the question as to whether this need for tighter coordination should have been recognized from the start, and whether this might have precluded the need to grant two project extensions and ensured that all proposed infrastructure was completed and functioning before the project finally closed.

6.16 Notwithstanding the above, given the speed at this project was prepared, appraised and approved, the quality-at-entry is rated as *Satisfactory*.

QUALITY OF SUPERVISION

6.17 Given the emergency nature of the operation, seed funding was used from ongoing IDA-supported projects in related sectors to kick-start expenditure on priority activities prior to Credit effectiveness. The procurement capacity installed in these two projects was also used to facilitate the start-up. These were effective means of facilitating early operations, but the project could presumably have used retroactive financing to cover urgent needs.

6.18 Eleven supervision missions were conducted in the five-and-a-half years between effectiveness and closure. In addition, the Task Team Leader and much of the task team was based in the Country Office in Abuja, and provided day-to-day support for implementation throughout the life of the project. The team was adequately staffed, with every mission including both human and animal health experts.

6.19 The team responded proactively to difficulties that had arisen during the first year of implementation. By March 2007, progress had slowed because key activities, such as surveillance, compensation payments, and communications, were not delegated effectively at the State and local government authority levels. The M&E system was not measuring progress adequately, and coordination among the three project components was insufficient. Steps taken during the Mid-Term Review, in May 2008, to address these issues included appointment of a Project coordinator, reallocation of funds among expenditure categories to decentralize activities further, including the piloting of participatory disease surveillance at the community level, and the mainstreaming of project activities into State government institutions. The supervision team strengthened the M&E system and identified baseline values for most indicators, but did not fully compensate for weaknesses in M&E design.³⁰ Ten new indicators were added to the results framework to monitor new activities, but the effectiveness of the new live bird markets were not assessed. Following the Mid-Term Review, implementation accelerated at the State and local government authority levels.

6.20 Also at the Mid-Term Review, the decision was taken to pilot four model live bird markets (a good practice from the Bank-supported HPAI project in Vietnam), and the number of model markets was subsequently expanded to 14. However, there was not

³⁰ For example, most indicators still tracked the completion of outputs, not the performance of intermediate outcomes over time, such as awareness or behavior. There was no rigorous evaluation of the live bird market pilot.

sufficient time in the project to ensure that these could be completed; most of these markets were not operational at project closure (and 6 were still not operational 18 months later).

6.21 The team demonstrated flexibility in the face of changing circumstances. For instance, when HPAI outbreaks declined significantly, resources were reallocated from compensation to other project activities, as were savings from project management activities. Project activities were well coordinated with other international agencies operating in the field, including UNICEF, WHO, the World Organization for Animal Health, the International Organization for Migration, and USAID.

6.22 A weakness in project supervision was in insufficient early support for procurement and implementation of laboratory upgrades. As a result of procurement and design delays, the BSL 3 lab was not procured and other laboratory upgrades and bird markets were procured late, which meant that they were not operational by the time of project closure. While a major factor in procurement delays were shortcomings in the capacity of implementing agency procurement staff, the Bank could have been more proactive in working with the Borrower to rectify this situation as a condition of granting project extensions.

6.23 On balance, quality of supervision is rated as *Satisfactory*. Together, these lead to an overall rating of Bank Performance of *Satisfactory*.

Borrower Performance

GOVERNMENT PERFORMANCE

6.24 The Government exhibited a high level of ownership and commitment to the project objectives from the start. Inter-ministerial coordination bodies were rapidly established at both the policy level and the implementation level. A crisis response unit was established in the President's office, and the first meeting of the policy steering committee was chaired by the President, which sent a strong signal that avian influenza control was a priority issue.

6.25 The Credit was processed rapidly and the Government complied with its obligation to finance compensation fund from its own resources in the period before the project became effective and Credit funds became available for this purpose.

6.26 Though government attention waned from 2008 onwards as no further avian influenza outbreaks occurred, the government demonstrated continued support for the project after closure by maintaining the system of desk officers, by using its own resources to finance purchase of the BSL 3 animal health laboratory, and by promising further resources with the stated goal of supporting the completion of project activities and mainstreaming project gains into regular government activities.

6.27 Overall, the Government performance is rated *Satisfactory*.

IMPLEMENTING AGENCY PERFORMANCE

6.28 The implementing agencies were the three directly concerned Federal Ministries – Agriculture and Rural Development, Health, and Information and Communications. Though there were some reports of inter-agency rivalry between health and agriculture early on, the ministries were generally successful in collaborating. The level of inter-ministerial cooperation was unusual for Nigeria, and was cited by all stakeholders as one of the success stories of the project. Cooperation was particularly effective during the period of the outbreaks, where local and state desk officers collaborated effectively in combining stamping out operations with human health screening and communications activities.

6.29 The Ministries worked effectively with technical partner agencies. The Ministry of Agriculture worked closely with FAO, OIE, ILRI, and the International Food Policy Research Institute in surveillance and various studies. The Ministry of Health collaborated effectively with the United States Centers for Disease Control and Prevention and the World Health Organization in promoting disease surveillance, strengthening diagnostic capacity, undertaking epidemiological surveys, and studies. The Ministry of Information coordinated communications activities and Knowledge, Awareness and Practice surveys with several agencies, particularly UNICEF.

6.30 While initially there was insufficient collaboration with stakeholders in devising the communications strategy, this error was corrected, and overall the implementing agencies worked effectively with poultry farmers, fowl sellers, veterinarians, and other stakeholders.

6.31 There were, however, significant procurement-related delays throughout implementation. Despite the emergency nature of the project and the need for rapid procurement, early in the project there too few procurement staff available who were experienced with Bank procedures. Although some improvement took place over time as the Human Health Component benefited from high level support for removing bottlenecks in the Health Ministry's procurement procedures, procurement for the Animal Health Component remained problematic throughout and suffered from staff turnover and the absence of a procurement officer for about five months in mid-2010. This led to delays that contributed to the lack of completion of the veterinary health laboratories and live bird markets. Weaknesses in communication between the centralized procurement office and end users also meant that some equipment and works were not well suited to meet local needs. Monitoring and evaluation systems were sometimes ineffective, and in some cases did not accurately record the situation on the ground.

6.32 Implementing agencies performance is rated *Moderately Satisfactory*. This leads to overall Borrower Performance rating of *Moderately Satisfactory*.

Monitoring and Evaluation

6.33 **Design.** As noted in the Monitoring and Evaluation Design section above, the M&E design was based on the Global Program on Avian Influenza blueprint. The Design had several weaknesses, including a focus on outputs rather than outcomes, a lack of inclusion of indicators for zoonoses or infectious diseases other than avian influenza, and an inability to assess whether capacity improvements were sustained over time.

6.34 **Implementation.** As noted in the section above on Implementation of Monitoring and Evaluation, the M&E system performed poorly in collecting data and reporting quantitative information. M&E system reports were also unreliable, and did not identify that laboratories and live bird markets were not operational.

6.35 **Utilization.** There was little evidence of M&E utilization; information was collected and shared with Bank supervision missions, but it is unclear if this was used to improve project management.

6.36 Overall, the quality of M&E is rated *Modest*.

7. Lessons

7.1 The project offers a range of lessons, both for similar health/animal health projects and for broader operations. These include:

7.2 **Government and implementing agency prioritization and enthusiasm will wane as perceived threats decline, with consequences for implementation.** If longer term capacity building activities are not commenced while enthusiasm is high (rather than being left to be worked on once the crisis has passed) then implementation of these activities may be slow. In this project, the fact that procurement of civil works and longer term capacity improvements did not begin during the early project stages contributed to implementation delays and to the lack of completion of laboratory upgrades by project closure.

7.3 **Pilots may have little impact in the absence of a rigorous assessment of the benefits and a clear plan for scale-up.** The model live bird markets may be a potentially valuable innovation if widely adopted (though the biosecurity benefits were not assessed), but project-supported markets had little impact because the project include a clear mechanism of demonstration that might lead to replication and scale up.

7.4 **An epidemic communication strategy requires inputs from all stakeholders, including the private sector.** This can make it more likely that harmful or inaccurate messages are avoided. Alarmist messages can backfire by harming the private sector and may trigger a hostile response from affected industries. Even once messages are adjusted, the change in message can confuse audiences.

7.5 **Including communications professionals can improve the quality of communications strategies.** Communication experts can devise an effectively targeted campaign for projects where public awareness is important. But communications with farmers may be more effective when done through agriculture agencies, which will likely have existing relationships and trust with farmers.

7.6 **Compensation systems can support disease reporting if compensation rates are at a level high enough to allow farmers to restock.** In this project, compensation rates of roughly 70 percent of market value supported sufficient reporting to allow for disease

control. Compensation systems can track market values more effectively if they allow payment rates to vary based on key determinants of value such as type and age of animal.

7.7 Compensation systems can be made more transparent by publishing names and amounts of compensation awards in local newspapers, online and through other media, as was done in this project. This can increase confidence in the mechanism, assist in encouraging other eligible groups to apply for compensation, and instill a degree of self-policing.

7.8 Centralized procurement systems can lead to inefficiencies if they do not consult end-users. While procurement centralization may reduce governance risks and reduce costs, insufficient consultation with end-users (such as checking that equipment is functional and works are satisfactory before processing and completing payments) can lead to gaps in capacity, redundant capacity, or buildings that are not used.

7.9 Reducing diagnostic response times relies on rapid sample transportation systems. Effective transportation systems can be achieved by engaging transporters, setting up contracts beforehand so they have confidence they will be paid immediately on delivery, and discussing biohazard risks openly and providing advice on appropriate safety measures. Reducing sample transport times may be cheaper and easier than reducing diagnostic testing times.

7.10 In projects involving multiple ministries, cooperation across ministries may be difficult in the absence of a single coordinator and if project management unit staff for different components are housed in different locations. These can assist in increasing the degree of cooperation between ministries, and in speeding project implementation. Implementation of this operation initially suffered from the lack of a single coordinator, which was later rectified.

7.11 Lack of experienced procurement staff in the project management unit at project inception can compromise the timely response to an emergency. In this project, a lack of procurement staff led to significant delays.

7.12 There were some additional secondary lessons. Radio ads and programs can be an effective way of reaching rural populations. Decentralizing outbreak response to state and local government levels can allow rapid response to containment operations. Laboratory systems need to be clearly tied into ongoing surveillance programs to ensure that capacity is maintained. Housing surveillance and diagnostic laboratories in universities, where they can be part of training programs, can increase the likelihood that capacity will be sustained in the long term. UN agencies can provide technical expertise that the World Bank lacks. Border control is unlikely to be effective in countries with highly porous borders.

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Annex A. Basic Data Sheet

AVIAN INFLUENZA CONTROL AND HUMAN PANDEMIC PREPAREDNESS AND RESPONSE PROJECT FOR NIGERIA (IDA-41600)

Key Project Data (amounts in US\$ million)

	<i>Appraisal estimate^b</i>	<i>Actual or current estimate^b</i>	<i>Actual as % of appraisal estimate</i>
Total project costs	62.20	49.90	80.2%
Credit amount	50.00	48.27	96.0%
Financing from other IDA credits ^a	12.20	1.90	15.6%
Cofinancing	-	-	-
Cancellation ^c	-	4.55	-

a. \$12.2 million of unused funds from the Fadama II and Health Systems Development II projects were made available to be used for avian influenza control if needed in the period before the avian influenza control project became effective. \$1.9 million of these funds were disbursed.

b. \$US equivalent for the credit's Special Drawing Rights (XDR).

c. Includes cancellation only from the primary IDA credit, not for funds from Fadama II or HSDP II.

Source: Disbursement summary report accessed January 30 2013 for disbursement figures, PAD and ICR for other figures.

Cumulative Estimated and Actual Disbursements

	<i>FY06</i>	<i>FY07</i>	<i>FY08</i>	<i>FY09</i>	<i>FY10</i>	<i>FY11</i>	<i>FY12</i>
Appraisal estimate (US\$M)	13.01	35.78	46.5	50	50	50	50
Actual (US\$M)	0.00	20.96	31.85	43.66	46.48	46.48	48.27
Actual as % of appraisal	0	59	68	87	93	93	97
Date of final disbursement:	10/6/2011						

Note: Disbursement figures include only expenditure from the primary IDA credit, and not for spending from the Fadama II and Health Systems Development II projects.

Project Dates

	<i>Original</i>	<i>Actual</i>
Concept review meeting	2/14/2006	2/14/2006
Negotiations	3/3/2006	3/8/2006
Board approval	3/21/2006	3/29/2006
Signing		4/5/2006
Effectiveness	4/15/2006	6/22/2006
Closing date	6/30/2009	5/31/2011

Staff Time and Cost

Stage of Project Cycle	Staff Time and Cost (Bank budget only)	
	Staff Weeks (number)	US\$ 000s (including travel and consultant costs)
Lending		
FY06	18	33
Total:	18	33
Supervision/ICR		
FY07	32	144
FY08	30	131
FY09	54	230
FY10	37	222
FY11	18	153
Total:	171	880

Task Team members

Name	Title (at time of appraisal and closure, respectively)	Unit	Responsibility/Specialty
Lending			
Simeon Kacou Ehui	Lead Economist	AFTS3	TTL, Lending
Lucas Akapa	Senior Operations Officer	AFTS3	Team Member
Francois Le Gall	Lead Livestock Specialist	AFTS3	Team Member
Monique Vledder	Human Development Specialist	AFTS3	Team Member
Samuel Eremie	Senior Agriculturalist	AFTS3	Team Member
Eva Jarawan	Lead Health Specialist	AFTS3	Team Member
Africa Eshogba-Olojoba	Senior Environmental Specialist	AFTS3	Team Member
Esther Walabai	Senior Agriculturalist	AFTS3	Team Member
Chukwudi Okafor	Senior Social Development Specialist	AFTS3	Team Member
Bayo Awosemusi	Senior Procurement Specialist	AFTPC	Team Member
Gert Van Der Linde	Lead Financial Management Specialist	AFTFM	Team Member
Adenike Mustafa	Senior Financial Management Specialist	AFTFM	Team Member
Anne Olugbo-Fisher	Senior Operations Officer	AFTH3	Team Member
Obadiah Tohomdet	Communications Specialist	AFREX	Team Member
Hisham Abdo Kahin	Counsel	LEGAF	Team Member
Macmillan Anyanwu	Operations Analyst	AFC12	Team Member
Supervision/ICR			
Lucas Kolawole Akapa	Senior Operations Officer	AFTAR	TTL, Supervision and /ICR
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Bayo Awosemusi	Lead Procurement Specialist	AFTPC	Team Member
Shobha Shetty	Sector Leader	AFTAR	Team Member

Chau-Ching Shen	Senior Finance Officer	CTRFC	Team Member
Olukemi Roseline Akinsola	Team Assistant	AFCW2	Team Member
Mary Asanato-Adiwu	Senior Procurement Specialist	AFTPC	Team Member
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Amos Abu	Senior Environmental Specialist	AFTEN	Team Member
Azra Sultana Lodi	Senior Program Assistant	AFTAR	Team Member
Mohinder S. Mudahar	Lead Consultant	SASDA	Team Member
Miki Terasawa	Social Development Specialist	SASDS	Team Member

Source: Technical Annex (appraisal), ICR (closure)

Annex B: Additional Data

Annex B1: Avian influenza

Avian Influenza (AI) is generally a disease of birds, but can also occur in humans if they come in contact with infected birds. Usually this will not lead to widespread human infections as the known existing AI virus types do not readily replicate and transmit between humans. However, the AI viruses are not stable and have the potential to change to produce a new strain that is able to replicate in humans and spread easily among them. If this happens a pandemic could occur. On average, three influenza pandemics per century have been documented since the 16th century, occurring at intervals of 10-50 years. In the 20th century pandemics occurred in 1918, 1957 and 1968. The 1918 pandemic was particularly severe and caused millions of deaths. In the 21st century another influenza virus (H1N1 type) emerged in April 2009 and caused a pandemic that rapidly spread to over 120 countries within 6 weeks. Fortunately, this time the disease was not severe in most cases.

Anticipating the actual timing of an AI pandemic and its severity is difficult because it depends on whether and when a virus circulating among birds would mutate or re-assort and become capable of spreading easily from human to human. The recent concern with the disease has arisen because of the virulent nature of the H5N1 virus circulating in poultry and the high death rate among those humans coming in contact with infected birds. One of the biggest worries is that conditions for mutation and re-assortment of the genetic make-up of the virus abound with birds living in close contact with humans particularly in “backyard” poultry production systems that are common in developing countries, including in East and South Asia and also Europe and Central Asia. In these poultry production systems farmers rear several animals such as chickens, ducks, pigs, and cows in their backyards, and in close proximity with human populations. Intensive agricultural practices, easy communication and trade across the globe and natural reservoirs for the virus in migratory birds have also made it easier for the virus to spread from wild birds to poultry and from infected poultry to humans. Resistance in current virus strains to one of the two classes of available antiviral drugs as demonstrated *in vitro* has added to anxiety about controlling a pandemic if it does occur.

Since 2003, 63 countries reported the highly pathogenic H5N1 form of AI in their domestic poultry (FAO 2012). The first outbreak was recorded in Korea in December 2003 (World Bank 2008). By 2004 the virus had spread to several East Asian countries and by 2006 had reached several Asian, European and Middle Eastern and African countries. Unchecked trade and movement of infected poultry was one of the main triggers behind the spread of the lethal virus (FAO 2006). In the first three months of 2011, Bangladesh, Cambodia, Hong Kong, India, Japan, Korea, Myanmar, and Vietnam reported outbreaks. The WHO reports a confirmed total of 610 cases and 360 fatalities as of December 2012, but the reported human instances of the disease from contact with infected birds understate the true number of infected people. Although disease awareness has increased, cases of H5N1 are still likely to be underreported.

Forecasting models envisage a major disease burden if a pandemic occurs, with 25-30 percent of the population falling ill and potentially enormous economic costs worldwide,

especially in the poorest countries, where resources for surveillance and health care are limited and population health and nutritional status are poor (Lazzari and Stohr 2004). The potential impact on GDP across countries and the human deaths arising from various forms (mild, moderate and severe) of the disease would be severe (Burns and others 2006). WHO estimates have suggested that, looking at the number of deaths from influenza pandemics in the last century, a relatively conservative estimate of deaths from a H5N1 pandemic would be between 2.0 and 7.4 million.

Annex B2: International donors, the World Bank, and Avian Influenza

The threat of a severe global human pandemic arising from mutation of the H5N1 virus has been an issue of great concern to the international community. Billions of dollars have been pledged and often diverted from other uses for efforts to control AI. Several international institutions such as the International Food Policy Research Institute (IFPRI), the International Livestock Research Institute (ILRI) and the Food and Agriculture Organization (FAO) and universities such as University of California, Berkley and Royal Veterinary College, University of London have been undertaking research associated with AI. There has been considerable concern with control and prevention strategies that have significant costs associated with them-including the direct costs of disease control measures such as vaccination, eradication, bio-security and the indirect costs of building institutions and mechanisms to support those measures (IFPRI 2008). The FAO, WHO and World Organization for Animal Health (OIE) have committed to work together in this area (FAO-OIE-WHO 2010). There is a realization in the international community of the importance of building partnerships among international donors and governments.

The World Bank has provided assistance to more than 50 countries for dealing with AI. The Bank has two main mechanisms to support client countries in this area: the Global Program for Avian Influenza Control and Human Pandemic Preparedness and Response (GPAI) and the multi-donor Avian and Human Influenza Facility (AHIF). The Bank's Board of Executive Directors endorsed the GPAI in January 2006, and extended it in June 2009. The GPAI is a global horizontal Adaptable Program Loan that allows for the use of up to US\$ 1 billion (extended from the original amount of US\$500 million) under which individual countries can obtain separate loans/credits/grants (depending on country case) to finance their own national projects.

The GPAI adaptable loan program draws on an integrated approach developed in conjunction with FAO, OIE, and WHO. Countries can access funding to strengthen their veterinary and health services to deal with outbreaks among animals, minimize the threat to people, and prepare for and respond to any potential human flu pandemic. GPAI operations are processed using emergency procedures, which allow quick preparation and approval. A country qualifies for support for an emergency project under the Program when it demonstrates its commitment and readiness to implement early detection and rapid response measures appropriate to the specific country conditions. The AHIF was created to assist developing countries in meeting financing gaps in their integrated country programs to minimize the risk and socioeconomic impact of avian and possible human pandemic influenza. In many cases, the facility co-finances projects under GPAI.

Annex B3: Human health influenza surveillance system in Nigeria

The national influenza reference laboratory is the focal point for an active surveillance system. Adults and children are screened at the four sentinel sites in Abuja, Lagos, Kano, and Nnewi, representing four of the six regions in Nigeria. For those patients who have symptoms of an influenza-like illness or severe acute respiratory syndrome, samples are taken, and these are sent within 48 hours to the national reference laboratory. Unusual cases are sent immediately.

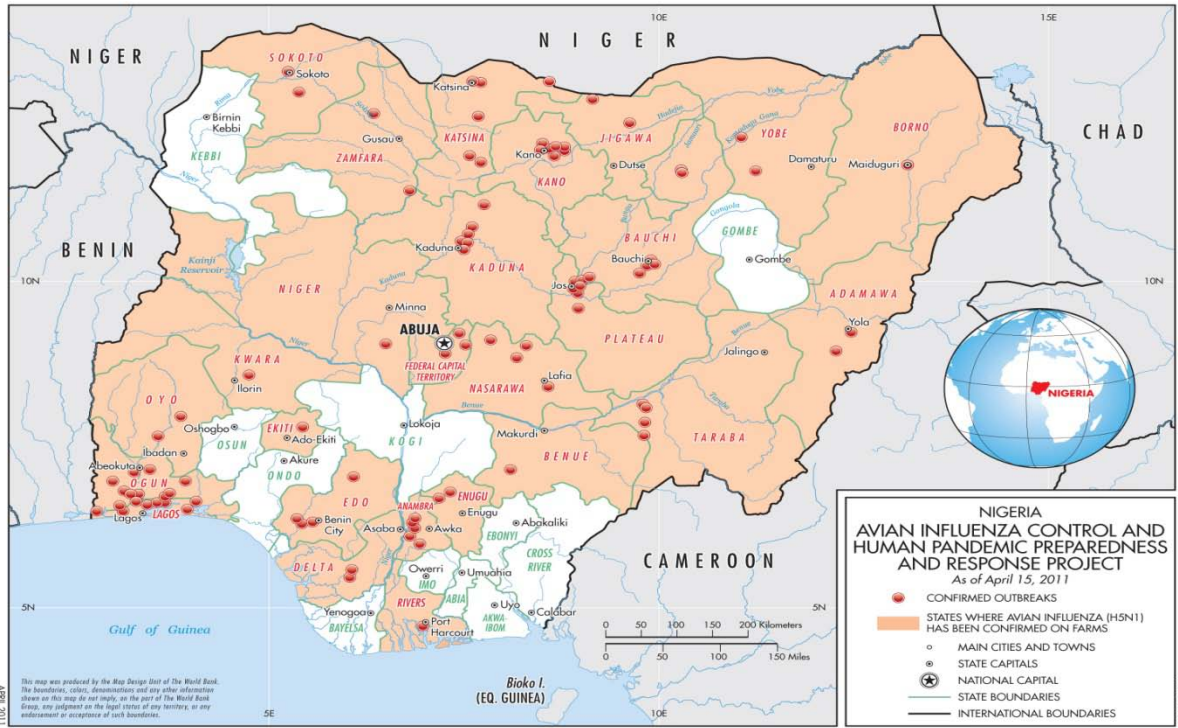
The samples go through an initial testing for influenza which can identify a presumptive negative or positive result; results are usually available within roughly 48-72 hours from sample collection. If the result is a presumptive positive, further testing is done to identify whether the sample is of influenza type A or B. If the sample is type A, it is further identified by subtype, and if of a serious strain would then be sent internationally to the WHO to a BSL 3 laboratory for confirmation. Results from this process will take roughly 1 month from the initial sample identification.

The number of presumptive positive cases identified is then recorded each week in the Integrated Disease Surveillance Response report that is assembled by the Federal Ministry of Health's Epidemiology Division, under the Nigeria Center for Disease Control. Data from this report feeds into the WHO global surveillance network.

The report also draws on a separate parallel passive surveillance system where routine health information is passed from the health facility to the local government, then on to the state government and the federal ministry of health. This system includes reports from the three regional and four zonal laboratories supported under the Avian Influenza Control Project, but also from other laboratories at health facilities throughout Nigeria. Though reporting is weekly, any unusual cases would be reported immediately, and any unusual activity in the number of daily cases of influenza-like illnesses would also be reported informally to the Nigeria Center for Disease Control.

There are some preliminary plans facilitated by the Nigeria Academy of Science to develop a real-time surveillance system that would partially merge animal and human health data, but there is no budget to support these plans.

Annex B4: Distribution of avian influenza cases in Nigeria



Source: World Bank 2011

Annex B5: Photographic evidence

Photo 1: Equipment supplied to the Veterinary Teaching Hospital Ibadan was unused



Source: IEG Field Mission, November 2012

Photo 2: Influenza laboratory at the Veterinary Teaching Hospital Ibadan is not operational



Source: IEG Field Mission, November 2012

Photo 3: Some equipment for diagnosing influenza was in use at University College Hospital Department of Virology, Ibadan



Source: IEG Field Mission, November 2012

Photo 4: Roughly half of equipment supplied to University College Hospital Department of Virology, Ibadan, was not in use (in part because it duplicated existing equipment)



Source: IEG Field Mission, November 2012

Photo 5: A new laboratory building at University College Hospital Department of Virology, Ibadan did not meet local requirements and was not in use 2 years after construction



Source: IEG Field Mission, November 2012

Photo 6: The upgraded Kuto Live Bird Market in Abeokuta was not yet in use



Source: IEG Field Mission, November 2012

Annex C. List of Persons Met

Federal Ministry of Finance

Dr. A.G. Ndayako-Mohammed, Assistant Director (Agriculture)
International Economic Relations Department

Federal Ministry of Agriculture and Rural Development

Dr. Joseph Nyager, Director/Chief Veterinary Officer
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Dr. Dooshima Kwange - Head of Epidemiology Unit
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Dr. Shuaib Belgore, Deputy Director, Department of Special Projects
Dr. Adedeji Adebayo, Deputy Director

Federal Ministry of Information and Communications

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Mrs. Margret Umoh, Deputy Director – Information
Mrs Comfort Agiboye, Assistant Director – Information
Mr. Abiodun Obafemi, Principal Information Officer - Information

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Mrs. Fatiemi, Secretary, Nigeria Fowl Sellers' Association
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Dr. Gani Enahoro, President, Nigerian Veterinary Medical Association
Dr. Monday Ojeamiren, Secretary General, Nigerian Veterinary Medical Association
Ms. Virginia Ifeadiro, Initiative for Food Environment and Health Society, Abuja
Mr T.A. Ogunmolu, Secretary, Abeokuta Fowl Sellers' Association
Mrs. Koleoso, Secretary, Treasurer, Abeokuta Fowl Sellers' Association

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Mr. Abimbola Adubi, Senior Agriculture Specialist, Abuja
Ms. Francisca Ayodeji Akala, Senior Health Specialist, Abuja
Mr. Obadiah Tohomdet, Senior Communications Specialist, Abuja
Ms. Mary Asanto-Adiwu, Senior Procurement Specialist, Abuja
Mr. Amos Abu, Senior Environmental Specialist, Abuja