REPORT

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GLOBAL PROGRAMME FOR THE PREVENTION AND CONTROL OF HIGHLY PATHOGENIC AVIAN INFLUENZA

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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
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"As more has become known about the disease (HPAI), its ecology and its epidemiology, and as more experience has been gained in fighting it, the rapidity and effectiveness of response to new outbreaks have improved enormously ... there is no doubt that FAO has played an important role in this positive evolution"

First Real-time Evaluation of FAO's Work on Highly Pathogenic Avian Influenza, February-June 2007

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Executive Summary

Following the outbreak and spread of the H5N1 virus strain of highly pathogenic avian influenza (HPAI) in Southeast Asia in late 2003-early 2004, the Food and Agriculture Organization of the United Nations (FAO) and the World Organization for Animal Health (OIE), in close collaboration with the World Health Organization (WHO), developed the *FAO/OIE Global Strategy for the Prevention and Control of Highly Pathogenic Avian Influenza*. The strategy focused resources on fighting and eradicating HPAI in animals in order to avert spread of the virus to humans and an eventual human influenza pandemic.

To meet its responsibilities under the Global Strategy, FAO developed a *Global Programme for the Prevention and Control of Highly Pathogenic Avian Influenza*. That programme, which is implemented by the Emergency Centre for Transboundary Animal Diseases (ECTAD) at FAO headquarters in Rome, emphasizes the need for both global and regional coordination in order to help HPAI-infected and at-risk countries develop effective prevention and control programmes. The Global Programme is regularly revised and updated to reflect the changing disease situation, to report how FAO expertise is being utilized to combat HPAI, and to report accurately on activities and budget monitoring.

By 2006, with HPAI having spread to other regions including Africa, it was estimated that US$882 million would be required for the three-year period 2006-2008 to fight HPAI in animals, excluding costs for compensating farmers whose flocks were culled. The estimated resource requirement of the FAO's Global Programme to support country requests within this budget was set at US$308 million. As of 15 November 2007, agreed donor funding and FAO own resources in support of the Global Programme amounted to US$187 million. Additional funding of US$26 million is under negotiation with donors. The funding requirement for the implementation of FAO's programme up to the end of 2008 amounts to US$121 million.

Key components of the Global Programme include coordination and management of the international response at global and regional levels; provision of support to infected countries in their efforts to control and eradicate the disease; assistance to at-risk countries in their efforts to prepare for an incursion of the disease; and technical support to newly-infected countries. Implementation of the programme entails a multidisciplinary approach, integrating animal health, socioeconomics, farming systems, wildlife and communication as essential components of a coordinated and integrated approach to tackling HPAI.

In implementing the Global Programme, FAO works closely with OIE and regional organizations involved in animal health. FAO is also working with WHO because of the threat to human health and with the United Nations Children's Fund (UNICEF) in grassroots communication. FAO and other UN agencies work under the umbrella of the office of the United Nations System Influenza Coordinator (UNSIC).

Global programme funding has been mobilized for a range of operational and technical activities, in particular for veterinary infrastructure development, training and capacity

building, and the provision of technical expertise, and for other activities enabling Member Nations to plan for early warning, efficient detection and rapid response to avian influenza. Since the start of the Global Programme, more than 130 countries have benefited from assistance either through specific interventions at national level or through regional support.

FAO's expertise has been deployed in a number of key sectors, including strategy design, national preparedness planning, surveillance, the provision of emergency laboratory and veterinary equipment, epidemiology and laboratory training, wildlife monitoring, support to culling, movement control, effective biosecurity on farms, vaccination, communication, policy support for the development of national compensation schemes, sectoral restructuring and safe poultry production.

Throughout 2007, activities have focused on strengthening global early warning and disease tracking, epidemiological investigation, consolidating epidemiological and laboratory networks, wildlife research and various socioeconomic and poultry sector studies, and implementing field projects in affected and at-risk countries. The Global Programme has also focused on improving FAO's efficiency and the efficacy of support to Member Nations through a Real-time Evaluation of its work, reorganizing the structure of ECTAD, and reinforcing the operational capacity of the FAO/OIE Crisis Management Centre/Animal Health (CMC/AH).

Through the Global Early Warning System (GLEWS), FAO has developed a database and mapping systems for disease tracking and analysis, data integration and disease monitoring for early warning purposes. GLEWS has helped gather and integrate information to provide a more detailed analysis of the evolving situation of HPAI, improve international preparedness for epizootics and provide rapid, efficient and coordinated assistance to countries experiencing them.

To support coordination and harmonization of regional approaches to early warning, efficient detection and rapid response to HPAI, FAO has established 14 subregional epidemiological and laboratory networks in Asia, Africa, the Middle East, Eastern Europe and Latin America. These networks assist Member Governments in developing enhanced epidemiological surveillance and diagnostic capability under the coordination of ECTAD regional units and Regional Animal Health Centres.

At the country level, FAO has been providing technical support to governments for the development and implementation of national strategic plans for HPAI control and long-term enhancement of veterinary services. In countries where the disease has become endemic, such as Indonesia, Egypt and Nigeria, FAO is increasing its technical and operational support in an effort to help manage HPAI outbreaks and minimize the ripple effects of the disease throughout the animal health sector and associated stakeholders. Particular attention is also being given to containing HPAI outbreaks and limiting the threat of virus dissemination in countries in which sporadic outbreaks are currently occurring. For unaffected countries which are at risk, the emphasis of FAO capacity building is to ensure early detection, rapid diagnosis and rapid response to contain and eliminate any outbreaks.

FAO's Global Programme contains a strong training element with the emphasis on regional capacity building to ensure that the gains are multiplied through a value added approach. Much emphasis is placed on training of trainers, thus empowering and devolving

ownership of the process to Member Nations. Training includes all facets of avian influenza and transboundary animal disease control, including laboratory diagnostics, epidemiology, disease surveillance (poultry and wildlife), emergency preparedness, disease control management and biosecurity. Workshops have also taken place to strengthen communication and socioeconomic analysis capacity, and a series of table-top simulation exercises were implemented at regional level in partnership with ECTAD's major partners. As of November 2007, more than 1 609 trainees had attended regional training programmes, and training activities had been replicated at national and local levels in more than 90 countries.

In response to requests from Member Nations, ECTAD has deployed missions to advise on the design and revision of appropriate national compensation strategies and to analyse costs and funding mechanisms for HPAI control strategies using alternative approaches to control based on a range of assumptions about disease epidemiology. In this respect, field missions were conducted in a number of countries or territories including Armenia, Côte d'Ivoire, Egypt, Indonesia, Mauritania, the Niger, Nigeria, Serbia, Viet Nam and the West Bank and Gaza Strip. Case studies were conducted in Egypt and Turkey to assess the trade impact and market shock effects of HPAI.

Between December 2006 and June 2007, the CMC/AH successfully deployed rapid assessment missions in response to HPAI outbreaks in seven countries in Africa and Asia, mobilizing technical and operational resources from headquarters, regional field offices and partners to respond to these outbreaks.

In support of wildlife surveillance activities, two surveillance campaigns were conducted between January and May 2006 and September 2006 and April 2007 in 14 countries in Africa, Middle East and Eastern Europe. These campaigns were coordinated by FAO and implemented through specialized international institutions in partnership with national wildlife and veterinary services. Approximately 18 000 samples were collected from migratory birds and analysed (none of which tested positive for HPAI H5N1).

Within the Global Programme, FAO is also committed to increasing the understanding of the epidemiology of the disease and its control by promoting and supporting applied research on global questions and issues to improve the quality of technical tools, methods and strategies available to decision-makers for combating HPAI and rehabilitating poultry industries. To this end, FAO has supported a series of studies to investigate the role of ducks and wild birds in the epidemiology of H5N1 virus and its ecology and, as part of the Global Programme, it continues to stimulate scientific discussion through international conferences, meetings, roundtables and other such fora.

This report provides an overview of these and other activities and progress made in implementing the Global Programme. The report details how FAO has utilized its technical expertise in animal health and its operational capacity to respond to the HPAI emergency at all levels, with an emphasis on direct assistance to Member Nations.

Introduction

The current panzootic of highly pathogenic avian influenza (HPAI) H5N1 first resulted in transboundary disease in late 2003 and early 2004 in Southeast Asia, and subsequently spread to Europe and both North and West Africa in 2005 and 2006. It has caused high mortalities in affected poultry flocks, with additional losses due to culling. Farmers and traders have suffered loss of income as a result of market disruption caused by control activities and also market shock due to consumer concerns for human health.

However, it has been a concern for human health, particularly the threat of a human influenza pandemic, that has drawn world attention to HPAI and stimulated donors to support HPAI control and preparedness measures for pandemic human influenza. Nevertheless, it is generally accepted that the most important way to address the threat of such a pandemic is to control HPAI in poultry in order to limit opportunities for exposure of humans to the virus and minimize the possibility for development of a virus with the potential to spread easily from human to human.

Following publication of *FAO Recommendations on the Prevention, Control and Eradication of Highly Pathogenic Avian Influenza (HPAI)* in Asia in September 2004, the *FAO/OIE Global Strategy for the Progressive Control of Highly Pathogenic Avian Influenza (HPAI)* was first produced in November 2005. Since then, there has been further spread of H5N1 HPAI and a substantial rise in international support, with a notable increase in activities funded through the generosity of a large number of donors, including national governments, and international development banks and development agencies, including FAO.

Over the almost four years since HPAI first emerged as a serious global problem, understanding of the disease has increased and experience with various control approaches has allowed FAO and its partners to refine strategy at the global, regional and national levels. The most recent version of the joint FAO/OIE strategy, now known as *The Global Strategy for the Prevention and Control of H5N1 Highly Pathogenic Avian Influenza*, was issued in March 2007[1].

[1] Available on the FAO avian influenza website (http://www.fao.org/avianflu).

PART 1
The Global Programme

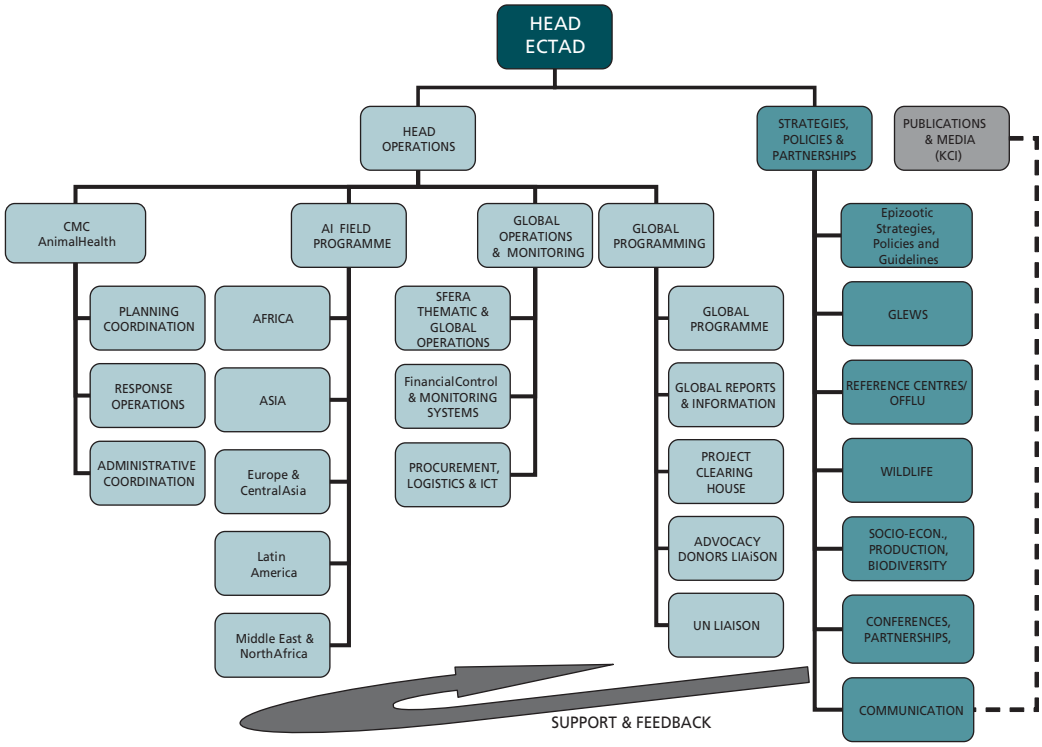
Within this context, and as the lead technical agency in animal health issues, FAO has set out its concrete objectives and activities in a *Global Programme for the Prevention and Control of Highly Pathogenic Avian Influenza*. That programme identifies the need to take a coordinated approach to prevention and control at global, regional and national levels, with an emphasis on support to infected countries in their efforts to control the disease, assistance to countries at risk of infection, and support for any newly-infected country to ensure a quick and effective control programme. The *Global Programme* focuses its activities in those sectors recognized as the key sectors in the Global Strategy: disease surveillance, laboratory capability and capacity, outbreak containment, vaccination, poultry production and market chain adjustment, and communication.

The *Global Programme* is the expression of the Global Strategy in terms of activities and is implemented under the general umbrella of the *Global Framework for the Progressive Control of Transboundary Animal Diseases (GF-TADs)*, a joint FAO/OIE initiative.

The institutional body responsible for day-to-day implementation is the *Emergency Centre for Transboundary Animal Diseases (ECTAD)*, which was established at FAO headquarters by the FAO Director-General in December 2004 to monitor the HPAI global disease situation and coordinate FAO's response. Through ECTAD, FAO provides policy and strategic advice, assistance with contingency planning, technical expertise, training, and laboratory and veterinary equipment and supplies.

Global activities are coordinated by an ECTAD management team at FAO headquarters in Rome, which is also responsible for overseeing communication, socioeconomic, wildlife and crisis management activities, and liaises closely with the *Global Early Warning and Response System (GLEWS)* and the joint *OIE/FAO Network on Avian Influenza (OFFLU)*. Regional and country activities are coordinated through ECTAD's regional units and animal health centres.

Figure 1. ECTAD organigram



ECTAD brings together staff and consultants from the Animal Health Service of the Animal Production and Health Division (AGA) and the Emergency Operations Service of the Emergency Operations and Rehabilitation Division (TCE) of FAO under the Chief of the Animal Health Service, who is also the FAO Chief Veterinary Officer (CVO).

ECTAD is made up of a number of units grouped under one of two principal divisions: strategies and operations, and policies and partnerships. The work of ECTAD is guided by a management committee chaired by the CVO which meets twice a week and is attended by the heads of the various component units. In addition, an ECTAD oversight committee of senior FAO managers informs and guides ECTAD's development.

Technical advice to national governments and regional organizations forms the core of ECTAD's work on HPAI. FAO seeks to enable Member Nations to plan for early warning, efficient detection and rapid response to avian influenza and to implement their national plans, thereby facilitating an overall efficient and effective global response to HPAI. For those countries where the disease has become endemic, FAO in-country resident experts help manage HPAI and minimize the knock-on effects of the disease throughout the animal health sector and associated stakeholders.

This expertise covers a wide range of areas, including disease control strategy development, preparedness planning, surveillance, laboratory diagnostics, capacity building, the provision of appropriate veterinary infrastructure, support to culling, movement control, effective biosecurity on farms, vaccination and policy support for the development of national compensation schemes and sectoral restructuring. Furthermore, this expertise

focuses on all aspects of the value chain, assessing socioeconomic effects on the animal health sectors and the people directly and indirectly affected. Communication of appropriate disease prevention and control strategies is a cross-cutting component of FAO's work.

While emergency and short-term assistance is indispensable, FAO is also committed to long-term control and eradication of the disease, not least because this will enable the Organization to be better prepared for other future transboundary diseases and zoonoses. In this regard, the FAO has developed substantial thematic work in partnership with UN agencies and specialized institutes.

In implementing the *Global Programme*, FAO has forged strong partnerships with OIE and WHO in particular, and works closely with the UN Children's Fund (UNICEF), which also plays an important role in avian influenza communication. FAO and other UN agencies work in close collaboration with UN Resident Coordinators leading country-level UN task forces and under the overall coordination of the office of the United Nations System Influenza Coordinator (UNSIC) in New York. Indeed, FAO played a key role in the formulation and development of UNSIC's Consolidated Action Plan, which aims to coordinate and focus the efforts of the relevant UN agencies in the global fight against avian and human pandemic influenza. The Consolidated Action Plan was last updated in September 2007[2].

FAO also works closely with other international institutions involved in combating HPAI such as the World Bank, the Asian Development Bank and the European Union, as well as strategic donors and regional bodies such as the Association of Southeast Asian Nations (ASEAN) and the African Union/Interafrican Bureau of Animal Resources (AU/IBAR).

[2] The report is available at http://www.un-influenza.org/documents.

PART 2
Global Support

Throughout 2007, activities have focused on strengthening ECTAD's core support activities – global early warning, disease tracking and epidemiological investigation, consolidating epidemiological and laboratory networks, carrying out wildlife research and various socioeconomic and poultry sector studies, and launching an animal health communication strategy – in addition to implementing field projects in affected and at-risk countries. The Global Programme has also focused on improving FAO's efficiency and the efficacy of support to Member Nations through a Real-time Evaluation of its work and a reorganization of the structure of ECTAD.

Global programme funding has been mobilized for a range of operational and technical activities, in particular for veterinary infrastructure development, training and capacity building, and the provision of technical expertise, and for other activities enabling Member Nations to plan for early warning, efficient detection and rapid response to avian influenza. Since the start of the Global Programme, more than 130 countries have benefited from assistance either through specific interventions at national level or through regional support.

FAO's expertise has been deployed in a number of key sectors, including strategy design, national preparedness planning, surveillance, the provision of emergency laboratory and veterinary equipment, epidemiology and laboratory training, wildlife monitoring, support to culling, movement control, effective biosecurity on farms, vaccination, communication, policy support for the development of national compensation schemes, sectoral restructuring and safe poultry production.

Since the emergence of HPAI in late 2003-2004, ECTAD has sent FAO experts on rapid assessment missions to bring immediate technical animal health and scientific expertise to those areas infected or at high risk of being infected. These missions assess national response capacity by evaluating HPAI preparedness and contingency plans, assist in strengthening preventive measures and provide technical and operational support for the containment of HPAI outbreaks. These rapid response missions, which have now been essentially incorporated into the structure and function of the FAO/OIE Crisis Management Centre/Animal Health (CMC/AH), have been enhanced by the development of round-the-clock functionality.

Within the *Global Programme*, FAO is committed to increasing the understanding of the epidemiology of HPAI and its control by promoting and supporting applied research on global questions and issues to improve the quality of technical tools, methods and strategies available to decision-makers for combating HPAI and rehabilitating poultry industries. To this end, FAO stimulates scientific discussion through conferences, roundtables and other such fora.

Besides the 'International Scientific Conference on Avian Influenza and Wild Birds' held in May 2006, FAO and OIE also co-organized, together with IZSV and the European Commission, an international conference entitled 'Vaccination: a tool for the control of avian influenza' in March 2007 in Verona, Italy[3]

In November 2007, FAO organized a high profile international conference on "Poultry in the 21st Century", funded jointly from the Special Fund for Emergency and Rehabilitation Activities (SFERA) and Regular Programme funds (see more information in section on *Socio-economics and farming systems*). In April 2007, a roundtable event on animal health communication was organized in collaboration with OIE and USDA at FAO headquarters (see more information in section on *Communication*). And from 27 to 29 June 2007, FAO co-organized and hosted a technical meeting in Rome[4], in partnership with OIE, WHO, UNSIC and UNICEF, as a prelude to the fifth International Conference on Avian Influenza to be held in New Delhi in December 2007. The purpose of this meeting was to assess progress in the global battle against avian influenza in animals and humans, identify the most urgent priorities, analyse the effectiveness of existing international mechanisms to combat avian influenza and plan strategy for the short, medium and long term. The outcome document of the meeting will be distributed to the participants at the New Delhi meeting[5].

The following key components of the *Global Programme* are based at headquarters, either because they are of a cross-cutting nature or because they require a constant interface between FAO and other global partners: crisis management, relations with technical facilities (GLEWS and OFFLU), wildlife surveillance, socioeconomics and animal health communication.

CRISIS MANAGEMENT CENTRE/ANIMAL HEALTH (CMC/AH)

In January 2007, the FAO Director-General announced the establishment, in collaboration with OIE, of a Crisis Management Centre[6] in the Office of the Assistant Director-General, Agriculture and Consumer Protection Department, to coordinate responses to crises in transboundary pests and diseases of animals and plants, as well as to food safety crises. In light of this development, and with experience acquired through the deployment of assessment missions, the objectives and mechanisms of the FAO/OIE Crisis Management Centre/Animal Health (CMC/AH) were slightly adjusted.

The CMC/AH has successfully deployed its rapid assessment capacity on a number of occasions – including prior to the official launch – and in response to a wide variety of situations. Even more importantly, the CMC/AH has shown itself capable of complementing the resident headquarters-based capacity with in-country operations, drawing on its continually developing surge capacity and streamlined rapid response mechanisms to initiate a process of service provision through assessment and response support activities based on tailored, timely and technically sound advice. Internally, the CMC/AH has taken significant

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[3] See Vaccination: a tool for the control of avian influenza on the FAO avian influenza website at http://www.fao.org/avianflu/en/conferences.html.

[4] See http://www.fao.org/avianflu/en/conferences/june2007/index.html.

[5] See http://www.delmincon.com/.

[6] The Crisis Management Centre was officially launched on 12 October 2006 at FAO headquarters.

steps forward to define its modus operandi and its relationship with other entities within and external to FAO.

Between December 2006 and June 2007, the CMC/AH successfully deployed its rapid assessment and response capacity on seven missions in response to HPAI in Afghanistan, Bangladesh, Ghana, Nigeria, the Republic of Korea, Saudi Arabia and Togo, mobilizing technical and operational resources from headquarters, regional field offices and partners to respond to these outbreaks. The results of all completed missions were shared in 'real time' with the wider FAO HPAI/EMPRES programme, as well as with the relevant FAO Representatives, and the experience acquired during their implementation has helped the CMC/AH to fine-tune four important reporting mechanisms: daily situation reports, handover reports, debriefings and end of mission reports (including end of joint mission reports).

In addition to these missions, the CMC/AH has been placed on alert on several occasions and has advised FAO in-country teams, without deploying its own teams. This was the case during the most recent outbreak in Turkey, but also during investigations in countries such as Azerbaijan and Myanmar.

The CMC/AH was set up thanks to donor support, which enabled the installation of equipment and facilities at FAO headquarters and covered the cost of its staff and activities, both at global and country level. As of 15 November 2007, total funding made available for the CMC/AH's implementation, functioning and field activities amounted to US$11.4 million, with an additional in-kind contribution valued at some US$2.2 million. A significant initial contribution came from SFERA, which enabled the launching of activities until additional donor funding was received.

GLOBAL EARLY WARNING SYSTEM (GLEWS)

The FAO/OIE/WHO Global Early Warning System (GLEWS) is the disease intelligence warning arm of ECTAD. This system integrates data with OIE and WHO, and from other sources (media reports, consultant mission reports, rumour tracking results, etc.) and shares this information with all stakeholders, including Member Nations. The end result is that GLEWS helps to provide warning messages based on the most up-to-date scientific information available, and therefore provides a basis for more accurate risk assessments to be conducted by the international scientific community, with the ultimate goal of contributing to the prediction of HPAI disease patterns.

With support from donors and FAO's Regular Programme budget, a GLEWS core team responsible for disease tracking, data integration, disease analysis and monitoring for early warning purposes was established at FAO headquarters and reinforced with expertise in epidemiology, disease ecology and mapping. Through this expertise, FAO has developed database and mapping systems, which are important for disease tracking. These have helped gather and integrate information to provide a more detailed analysis of the evolving situation of HPAI, and will improve international preparedness for epidemics and provide rapid, efficient and coordinated assistance to countries experiencing them.

In order to assist national veterinary services in the timely recording and effective utilization of disease information for decision-making in the prevention and control of animal diseases, ECTAD has been providing TADinfo® – the FAO open-source database/mapping software – to Member Nations to strengthen their information management. TADinfo has

been developed by FAO under an open source licence. Several countries are already using the latest version, and in particular, Viet Nam is using TADinfo intensively for HPAI outbreak reporting. ECTAD has also been providing training in the effective use of TADinfo; so far more than 50 people have been trained. There are also some 20 more countries preparing to introduce TADinfo for improved disease recording and timelier situation analysis in order to be able to react more rapidly in containing outbreaks. This will include customization, installation, training, backstopping, troubleshooting and support. Further financial support is required to promote and sustain these activities in countries requesting these services.

OFFLU NETWORK

OFFLU is an international network of laboratory expertise on avian influenza established by OIE and FAO. The network covers OIE/FAO reference laboratories, epidemiology collaborating centres and expertise groups in avian influenza. The Istituto Zooprofilattico Sperimentale delle Venezie (IZSV) has been named coordinator and secretariat of the network. At FAO headquarters, a veterinarian seconded from the French government handles OFFLU activities and liaises with OIE and the OFFLU secretariat at IZSV in Padova, Italy.

Through OFFLU, FAO has provided specialized laboratory and epidemiology services, and training and veterinary expertise to Member Nations to assist in the control and eradication of HPAI. OFFLU has also continued to liaise with the WHO laboratory network on the exchange of strains and information between human and veterinary laboratories. OFFLU assistance has been directed towards supporting key areas such as molecular epidemiological studies on virus isolates from infected countries; testing of samples from wild birds from non-infected countries with limited capacity for in-country testing; assisting with the training of personnel from national laboratories; assisting with the training of field staff for epidemiological surveillance and specimen collection; and providing reference reagents and advice for laboratory testing quality assurance.

To ensure accurate diagnosis of HPAI outbreaks and virus strain monitoring, FAO provides logistical assistance to Member Nations for shipping samples or isolates to OIE/FAO reference laboratories. It has contracted a shipping company to offer a door-to-door service, and coordinates the links among dispatching laboratories, the shipping company and receiving reference laboratories. These activities have greatly improved the diagnostic capability of national veterinary laboratories in many countries, significantly contributed to monitoring the course of HPAI and ensured that the plans for disease control in infected countries – and surveillance and preparedness in non-infected countries – are based on sound scientific knowledge.

GLOBAL WILDLIFE SURVEILLANCE

In collaboration with partners, ECTAD has continued to support epidemiological studies that evaluate linkages between agriculture and wildlife as possible modes of disease transmission and spread; studies to identify wild bird HPAI H5N1 virus carriers, shedders and transporters; wildlife ecology studies that look at key wildlife species, their migratory patterns, habitat use, and the timing of migration as it relates to HPAI H5N1 outbreaks in poultry and wildlife; risk analyses, including geographic information system (GIS) mapping

of historical and expected outbreaks using available FAO-OIE data; and remote sensing as a tool to better understand how environmental conditions may be playing a role in the emergence of this disease.

Training and capacity building in wildlife surveillance

Since the start of the Global Programme, FAO has coordinated, facilitated or implemented training sessions for more than 150 national officials from more than 80 countries in Africa, Asia, the Caribbean, Europe and South America, on wildlife, ornithology and disease issues. This training has combined classroom instruction with field activities including wild bird capture, restraint and proper sample collection for the purposes of H5N1 HPAI testing. Within the framework of ECTAD, FAO has written and is about to publish a second training manual entitled *Wild Bird Ecology and Techniques Manual*, which will contain information about the history of H5N1, wild birds, wetlands and the ecology of bird groups vulnerable to the virus. The manual, which complements the already published *Wild Bird AI Surveillance – A Manual for Sample Collection from Healthy, Sick and Dead Birds*, will address wild bird capture techniques, bird handling and ringing techniques, disease sampling procedures, avian surveys and monitoring, radio telemetry and bird movements.

Wild bird surveillance and ecology studies

A second round of surveillance to track the evolution and possible spread of the virus along migratory routes was carried out from September 2006 to April 2007 in Burkina Faso, Chad, Egypt, Ethiopia, Iran, Kenya, Malawi, Mali, Mauritania, Morocco, the Niger, Nigeria, Romania, Senegal, the Sudan, Tunisia, Turkey, Ukraine and Zambia. Approximately 18 000 samples were collected and of at least 10 000 samples already analysed none tested positive for HPAI H5N1. FAO has also supported multiple wild bird disease ecology studies. In each of these projects, FAO has worked with various partners, including the United States Geological Survey (USGS). In total, FAO has deployed approximately 100 satellite transmitters since July 2006 on 14 species of migratory waterfowl in China (Poyang Lake and Qinghai Lake), Malawi, Mali, Mongolia and Nigeria. Future plans include projects in the Black Sea basin, India and Serbia. As the global community continues to demand better information on wild bird movements and habitat use, and as FAO seeks to gain better insight into the transmission patterns, spread and drivers of disease emergence, these projects are becoming more important and valuable.

SOCIOECONOMICS AND FARMING SYSTEMS

ECTAD's socioeconomic activities have been funded primarily by resources from the Special Fund for Emergency and Rehabilitation Activities (SFERA) and donor-funded projects. These funds have played a catalytic role in the implementation of various activities in four areas: i) social and economic impacts of HPAI outbreaks and control measures; ii) costs and financing of avian influenza control strategies; iii) HPAI trade impacts and market shocks; and iv) safe poultry production. The following are some examples of activities in each of these areas:

Social and economic impacts of HPAI outbreaks and control measures

A livelihoods toolkit originally developed for Turkey was modified for Egypt, where it has been used to collect data on the impact on livelihoods of HPAI and its control in the poorest areas of the country. This study was carried out in collaboration with the World Food Programme (WFP). Results were made available in mid-2007, and present a clear picture of the problems presented by HPAI infection and control among poor rural households. The same toolkit is being used as the basis for assessing the impacts of HPAI disease control and prevention methods in Cambodia and Uganda while a modified version was used for a livelihoods assessment in the Lao People's Democratic Republic.

Costs and financing of avian influenza control strategies

Guidelines have been developed for designing a compensation strategy and members of the socioeconomics team have made many presentations on compensation in the context of regional discussions on good practice. For instance, a presentation was made at an Asia-Pacific Economic Cooperation (APEC) meeting in Viet Nam to a group of veterinary officers from Asian countries, and another made at a regional workshop in Peru to stakeholders from Latin America animal health systems and the poultry sector. Regional workshops covering the issue of compensation were also held in West Africa and the Middle East. SFERA funds paid for the participation of FAO's expert on compensation at these workshops. In response to requests from Member Nations, ECTAD has sent field missions to and advised on the design and revision of national compensation strategies in Argentina, Armenia, Bosnia & Herzegovina, Cote d'Ivoire, Ghana, Serbia, Togo and the West Bank and Gaza Strip. The socioeconomics group has also worked with the economics section of the Egyptian Ministry of Agriculture and Land Reclamation on the development of a compensation policy. This policy was made available in July 2007.

HPAI trade impacts and market shocks

Case studies on market shocks in Egypt and Turkey were presented along with a concept paper on markets and trade dimensions of avian influenza prevention and control at the Inter-Government Group (IGG) on Meat and Dairy in November 2006. The IGG included a wide range of industry representatives and the symposium explored the extent to which market shocks from disease outbreaks can, or cannot, be mitigated by market practices and government policies. The proceedings from the symposium were completed in early 2007 and are available on the FAO HPAI website. The studies have demonstrated that a market shock can begin with the announcement of the disease in a neighbouring country. They highlight the need for measures by government and the private sector to mitigate market impact, such as consistent information provided through trusted sources. Controlling any disease is difficult when the market is in chaos. Reports from country representatives during the FAO-led international meeting on HPAI control in June 2007 suggest that there is increasing concern about market shock impacts. Experience from Thailand and Turkey suggest that balanced and timely communication may be the most effective way to mitigate them.

Safe poultry production

In Egypt, FAO supported studies to assess and analyse the local poultry sector in order to identify easily affordable interventions for improving the biosecurity of small-scale poultry producers and poultry markets. In December 2006, two ECTAD consultants visited governorates in different parts of Egypt and interviewed a number of stakeholders in the poultry sector and the value chain. FAO's efforts focused on bringing direct benefits to farmers through the prevention of contact between animals and pathogens, decreasing the spread of germs and improving biosecurity. The assessment examined poultry husbandry practices that reduce contact and spread of pathogens among birds. Options for improving biosecurity that have direct benefits to the producer were explored. Donor funds have helped in the production of technical guidelines on practical and affordable husbandry methods for smallholders and safe and affordable poultry handling for traders and market operators, and has enabled national poultry sector reviews in seven countries (Benin, Cameroon, Ghana, Mali, Nigeria, Senegal and Togo). Donor resources have also facilitated a regional poultry review in West Africa and a duck farming systems review in Indonesia and Viet Nam.

There is an increasing emphasis within ECTAD on multidisciplinary approaches to animal health planning. To further this aim, the socioeconomics, policy and production group is working with the epidemiologists of ECTAD and GLEWS to map the poultry market chains in Indonesia, learning not only about flows of product and value (a traditional economic approach) but also adding qualitative risk assessment. The combined methodology was drawn up in late 2006-early 2007, and studies are in progress in Indonesia and Myanmar and planned for Cambodia and four West African countries, to be followed up with workshops for stakeholders in animal health planning.

The Real-time Evaluation of ECTAD identified the importance of viewing HPAI in the context of poultry sector development. In November 2007, FAO held an international conference "Poultry in the 21st Century", funded jointly from SFERA and Regular Programme funds. The aim was to review the global poultry sector in its entirety, to assess past developments, the current situation and development 'hot spots', and to explore scenarios for its future, beyond avian influenza. The conference was organized into three main sessions on: "Sector trends and impacts"; "Risks and Challenges for Poultry Production" and "Poultry as a development tool". A synthesis document is under preparation and the full proceedings will be published early in 2008. The conference was rated useful and successful by participants and the main conclusions will be drawn into ECTAD's work during 2008.

ANIMAL HEALTH COMMUNICATION

ECTAD's communication strategy is intended to serve as a facilitating mechanism for building an enabling environment through which the *FAO-OIE Global Strategy* can be successfully understood and implemented in order to reduce the occurrence of HPAI infection in poultry, thereby reducing the risk to public health, protecting the livelihoods of poor farming communities and securing national, regional and international markets and trade in poultry and poultry products.

Since mid-2006, and with very modest human and financial resources, FAO has strategically and successfully advocated with partners (particularly OIE, UNICEF, UNSIC, WHO and the World Bank) and national governments, that in order to stop the spread of HPAI, more attention and enhanced investments (technical, financial, human) are needed in the domain of animal health communication.

This is clearly reflected by the large surge in demand for technical assistance and guidance in HPAI communication that FAO has been receiving from national governments, as well as other partners involved in the coordination and implementation of HPAI prevention/control communication campaigns.

In April 2007, FAO and OIE organized an International Animal Health Communicators' Roundtable in Rome to develop recommendations to enhance multilateral coordination of communication and public awareness initiatives that support the *FAO/OIE Global Strategy for the Prevention and Control of HPAI*. Participants at the meeting included communication specialists and subject matter experts from multilateral organizations and government agencies. At the roundtable, experiences were shared on key issues, challenges and gaps in communications/public awareness initiatives aimed at combating HPAI; recommendations were developed and prioritized to sustain a coordinated communication agenda; and consensus was built on the need for effective mechanisms to strengthen inter-agency cooperation. The main outcomes from the Roundtable were subsequently presented and endorsed in the form of key recommendations at the FAO-WHO-OIE Technical Meeting on Avian and Pandemic Influenza (Rome, June 2007).

Following these two meetings, FAO announced the formal establishment of a new ECTAD Communication Unit, based at its headquarters in Rome. With core funding from USAID, technical cooperation with AED, additional FAO resources from other donor agencies, and in partnership with key international organizations (OIE, UNICEF, WHO, the World Bank, etc.), the ECTAD Communication Unit will advocate for and play a leadership role in the implementation of the recommendations related to HPAI communication.

International support is being sought for building a critical mass of HPAI communication specialists within FAO, to conduct multidisciplinary research to inform strategy-building, as well as, to provide direct technical assistance to Ministries of Agriculture/Livestock in rapidly building their communication capacities and competencies to respond effectively to HPAI.

Currently, communication activities include:

- development and dissemination of key messages and information on the prevention and control of HPAI, with a focus on the most-at-risk populations, as well as the media, frontline extension workers, the scientific community, and ministries of agriculture and livestock;
- participation in backstopping and technical assistance missions; rapid country assessment missions and providing communication input to training workshops;
- building and strengthening partnerships with UNICEF, WHO, the World Bank, NGOs, specialized communication agencies, poultry producers, farmer associations and communication teams of ministries of agriculture in various countries;
- provision of technical input and partnering in the development of inter-agency communication toolkits, guides and materials;
- contributing to the development of communication research/evaluation methodolo-

gies, and community-based surveys and participatory action research studies on avian influenza; and

- development of a global strategic communication framework and plan based on emerging lessons, to support the FAO/OIE Global Strategy.

These activities are primarily supportive, of an emergency nature, and driven by requests from a number of countries in various regions (Southeast Asia, Africa, Central Asia, and Europe), and partner organizations (including UNICEF, WHO and the World Bank). Nearly 60 countries in various regions of the world will benefited from inputs and briefings on outbreak and strategic communication planning, as part of a series of regional HPAI prevention/control technical support workshops.

PART 3
Regional and Country Support

REGIONAL ECTAD UNITS AND ANIMAL HEALTH CENTRES

The *Global Programme* sets out ECTAD's commitment to regional coordination and recommends the establishment of joint Regional Animal Health Centres (RAHCs) in collaboration with OIE to coordinate ECTAD's response at the regional and national levels. Conducting activities at a regional level complements national support, facilitates the sharing of best practice and expertise, and enables economies of scale.

Following the establishment of a decentralized ECTAD unit in the FAO Regional Office in Bangkok to supervise and coordinate the regional programme in South and Southeast Asia, four RAHCs have been established to cover Eastern Africa, North Africa, Southern Africa and the Indian Ocean islands and West/Central Africa. These RAHCs are a joint initiative of OIE-FAO and AU-IBAR, building on the complementarities of the mandates of the three institutions within the framework of the FAO-OIE GF-TADs initiative and the Africa Livestock (ALive) Partnership Platform. In the near future, a fifth RAHC in Beirut will cover Middle East countries in close collaboration with OIE. Arrangements are being made to establish additional RAHCs in other locations to cover Central Asia, Latin America and South Asia.

Regional ECTAD units are usually established in the RAHCs. They enhance ECTAD's ability to monitor the disease situation, build capacity, take pre-emptive steps to prevent infection and help countries to manage outbreaks. They aim to be centres of technical (veterinary, socioeconomic, animal production and communication) and operational excellence, feeding into and responding to ECTAD headquarters. The regional ECTAD units will enable FAO to be even more responsive to the changing global disease situation, working with regional and national structures to deliver timely technical and operational inputs in support of the overall goals of the *Global Programme*.

REGIONAL NETWORKS

A key role of the regional ECTAD units will be to establish and strengthen regional networks of national diagnostic laboratories, epidemiological surveillance teams and socioeconomic teams, because lessons learned from a disease experience in one country are a valuable tool for other countries' preparedness and response to the same disease. This can only be accomplished when there is a transparent exchange of disease information among countries and a collaboration of efforts across areas. This requires networking at many levels including field and central/national level, veterinary diagnostic laboratories and epidemiology teams.

Since early 2004, 14 sub-regional epidemiology and laboratory networks in Asia, the Middle East, Eastern Europe and the Caucasus, Africa and Latin America and the Caribbean have been established through ECTAD and under the general scope of GF-TADs. In Asia,

three sub-regional networks are currently active (in East Asia, South Asia and Southeast Asia) and are assisting member governments to support enhanced epidemiological surveillance and diagnostic capability. These sub-regional networks are coordinated through the decentralized ECTAD unit established in the FAO Regional Office in Bangkok and supported by sub-regional coordinators of the three networks in Bangkok, New Delhi and Beijing. A similar networking approach has been adopted in Africa (Eastern Africa, North Africa, Southern Africa and West/Central Africa) and the Middle East since early January 2006.

FAO, with donor support, is assisting governments to put in place effective, harmonized frameworks and policies to support enhanced epidemiological surveillance and diagnostic capability. The RAHCs are taking over the responsibility of coordinating these networks within the framework of GF-TADs and partnership initiatives with other international and regional organizations. These networks will be further developed and ultimately regional organizations should take the lead or contribute to managing such networks for long-term sustainability.

ASSESSMENT MISSIONS

Since the emergence of HPAI in late 2003-2004, ECTAD has sent FAO experts on rapid assessment missions to bring immediate technical animal health and scientific expertise to those areas infected or at high risk of being infected. These missions assess national response capacity by evaluating HPAI preparedness and contingency plans, assist in strengthening preventive measures and provide technical and operational support for the containment of HPAI outbreaks. These rapid response missions, which have now been essentially incorporated into the structure and function of the FAO/OIE CMC/AH, have been enhanced by the development of round-the-clock functionality.

EMERGENCY ASSISTANCE

The most substantial commitment of the programme's funds has been to provide equipment and supplies to Member Nations. As the scale of the HPAI global emergency became clear, ECTAD took proactive steps to furnish countries with the means to take basic measures to combat any detected or suspected outbreak. Emergency kits of basic veterinary equipment and supplies were purchased and shipped to the most vulnerable countries. Typically these kits contained personal protective equipment (PPE), autopsy materials, syringes, reagents, disinfectants, sampling instruments, shipment boxes, culling bags, mist blowers and sprayers, and vaccine boxes. In making these kits available to Member Nations, the aim was to provide a first defence against the disease. It was always the intention to complement the provision of this equipment with expert advice, training and in many cases additional supplies in order to strengthen countries' long-term capacity for action and response. Since the start of the Global Programme more than 130 countries from Africa, Asia, Eastern Europe, Latin America and the Middle East have benefited from this emergency assistance.

TRAINING AND CAPACITY BUILDING

Training and capacity building are essential parts of FAO's Global Programme. FAO's operational experience and technical expertise have maximum impact when they are shared with

counterparts at national level, who are able to gain knowledge and skills to pass on themselves. Many Member Nations are hampered by under-resourced animal health units with neither the equipment nor the ability to plan for outbreaks or deal with them when they occur. FAO's provision of equipment and supplies to countries is therefore of very limited value unless it is followed up with practical instruction and networking to make permanent improvements at national and regional level. The success of the programme is dependent on having managerial and technical staff at all levels with the knowledge and skills required for effective prevention and control of the disease.

Since the start of the Global Programme, FAO has coordinated and implemented in all target regions a series of regional training workshops under the coordination of ECTAD Regional Units and RAHCs. Much emphasis is placed on training of trainers as a way to empower and devolve ownership of the process to Member Nations. Training includes all facets of avian influenza and transboundary animal disease control, including laboratory diagnostics, epidemiology, disease surveillance (poultry and wildlife), emergency preparedness, disease control management and biosecurity. Workshops have also taken place to strengthen communication and socioeconomic analysis capacity. A series of table-top simulation exercises was implemented at regional level in partnership with ECTAD's major partners.

As of November 2007, regional training had been held for more than 1,600 trainees from many countries in Africa, Asia, Eastern Europe, Latin America and the Caribbean and the Middle East. Training activities have been continuously replicated at national and local levels through country-specific projects. To date, FAO has mobilized more than US$6.6 million (eight percent of commitments) to support these activities, reflecting the importance that FAO places on capacity building through training.

OVERVIEW OF REGIONAL AND COUNTRY PROGRAMMES

FAO has mobilized its own resources and donor funding to enable timely support for prevention and control of HPAI in more than 130 countries. While it is very important to provide immediate assistance to countries experiencing outbreaks of HPAI, it is also imperative to prepare countries that may be at risk of becoming infected while continuing to help countries where the disease has become endemic. Support has been provided through regional programmes as well as country-specific projects. Conducting activities at a regional level complements national support, facilitates the sharing of best practice and expertise and enables economies of scale. FAO technical and operations staff have been stationed in ECTAD Regional Units and in all of the newly-affected and endemic countries to assist authorities in the implementation of their control activities.

At the country level, FAO has been providing technical support to governments for the development and implementation of national strategic plans for HPAI control and long-term enhancement of veterinary services. In countries where the disease has become entrenched, such as Egypt, Indonesia and Nigeria, FAO is increasing its technical and operational support in an effort to help manage HPAI outbreaks and minimize the ripple effects of the disease throughout the animal health sector and associated stakeholders. Particular attention is also being given to containing HPAI outbreaks and limiting the threat of virus dissemination in countries in which sporadic outbreaks are currently occurring. For unaf-

fected countries which are at risk, the emphasis of FAO capacity building is to ensure early detection, rapid diagnosis and rapid response to contain and eliminate any outbreaks.

The following sections present an overview of programmes activities in Asia and the Pacific, Central Asia, Africa, the Middle East, Eastern Europe and Latin America

Asia and the Pacific

ECTAD's coordinating office in the region, which is part of FAO's Regional Office for Asia and the Pacific (RAP), covers 17 countries: nine countries in Southeast Asia, five in South Asia and three in East Asia. The level of technical support to these countries varies from country to country. There are 11 regional projects and 14 Government Cooperative Programme (GCP) projects at the country level. The total value of assistance since the beginning of 2006 for the Asia-Pacific region totals US$91.5 million.

RAP ECTAD is not only collaborating at the country level, but also at the regional and global level. It has co-hosted various regional events on avian influenza with the support of the United States Agency for International Development (USAID), the Government of Japan, the Association of Southeast Asian Nations (ASEAN) Secretariat, the Asian Development Bank (ADB) and OIE. At the regional level, RAP ECTAD is facilitating dialogue to harmonize regional strategies and policies such as socioeconomics, vaccination, culling, compensation and impact on livelihoods. FAO has been working in cooperation with the ASEAN Secretariat to develop a regional avian influenza preparedness plan.

In collaboration with OIE, the ASEAN Secretariat, USAID, the Government of Japan and ADB, the RAP ECTAD team has organized numerous workshops and seminars. FAO organized the Behaviour Change Communication Regional Workshop in November 2006 (Phnom Penh, Cambodia), the Japan Trust Fund Steering Committee Meeting in December 2006 (Bangkok, Thailand), the FAO Regional Technical Officers Meeting in January 2007 (Bangkok) and the Second ASEAN Workshop on HPAI Control and Eradication in February 2007 (Kuala Lumpur, Malaysia). ECTAD RAP also organized regional meetings with the Government of Japan and USAID. Members of the RAP ECTAD team have participated in several global and regional fora and presented papers on problems and successes dealing with HPAI prevention and control.

At the country level, FAO has been providing technical support to governments in the development of national strategic plans for HPAI control. Once plans are officially adopted by a national government, FAO provides support in the implementation of the strategic plan through projects to contain and control the disease as well as strengthen the capacity of veterinary services. In several countries in Asia, FAO is also assisting governments in monitoring national plans and revising or adjusting them as required.

Since September 2006, FAO project implementation has been increasing steadily. FAO has employed specialized international experts at the regional and national level who are presently involved in assisting member countries in the region to contain HPAI. Fields of expertise include poultry disease, epidemiology, biosecurity, laboratory diagnosis, socioeconomics, virology and communication. FAO has also provided support to project operations and management including financial and procurement support. The equipment and supplies provided include highly sophisticated laboratory equipment to upgrade national laboratories and polymerase chain reaction (PCR) machines to test and detect the H5N1 virus in diagnos-

tic samples, rapid test kits, reagents, and other field surveillance supplies, as well as personal protective equipment (PPE) and vehicles and motorcycles for rapid surveillance and response. During the reporting period, projects in Asia and the Pacific have provided equipment and supplies to the participating countries through the regional and country-level projects.

Training of national government counterpart staff at different levels is one of the main activities of FAO's projects in Asia. Such training includes participatory surveillance and response training at the community level, training of trainers (TOT) on disease surveillance and response at the provincial and regional level, laboratory training on equipment use, analysis and procedures, and use of standard operating procedures (SOPs). Training is carried out at the national, regional and international level.

One of the most significant results of FAO's support to member countries has been a notable improvement in the capacity to organize rapid response during avian influenza outbreaks. During the most recent outbreaks in Bangladesh, Lao People's Democratic Republic and Myanmar, the veterinary services in each country organized emergency surveillance teams and confirmed the outbreaks in various locations rapidly. This is an important improvement in country response time compared to mid-2006.

COUNTRY HIGHLIGHTS

Bangladesh

Bangladesh has taken pre-emptive preparatory action following the examples of other affected countries and formulated a National Avian Influenza and Human Pandemic Influenza Preparedness and Response Plan for 2006-2008, with technical assistance from FAO and WHO. Over the last year, the Ministry of Fisheries and Livestock introduced a number of proactive measures for implementing the plan and organized training programmes, enhanced laboratory facilities and procured equipment for testing.

Until recently, Bangladesh had been unaffected by but at high risk from HPAI outbreaks. However, outbreaks were reported to OIE from Jamalpur district in early February 2007 and in March 2007 the first signs of a poultry epidemic at the Biman Poultry complex in Savar were identified. The farm's entire bird population was culled and samples were submitted to laboratories for diagnosis. Since then, the H5N1 bird flu virus has been spreading in poultry flocks across the country's farms despite culling and banning of the movement of poultry in areas with confirmed outbreaks. Since the detection of the H5N1 virus in February, more than 98 000 chickens have been culled on 38 farms in nine districts. No humans have tested positive for the disease. Bangladesh has 125 000 small and large poultry firms producing 250 million broilers and six billion eggs annually. Bangladesh also has about 33 million ducks. About four million Bangladeshis are directly or indirectly associated with poultry farming. A CMC/AH rapid response mission visited Bangladesh in March 2007 to assess the disease situation and make recommendations to the national authorities on ways to strengthen capacity and limit the spread of the disease.

The Asian Development Bank provided FAO with emergency funding totalling US$1.5 million for immediate response activities including surveillance, virus elimination and communication. This funding is in addition to ADB's grant agreement for regional HPAI control activities. FAO experts carried out a rapid assessment mission to investigate outbreaks

of avian influenza in poultry and recommended measures to contain the disease. The government declared a one-km infected area and culled all in-contact birds and banned rearing all types of chickens, ducks and pigeons in targeted areas following the detection of avian influenza virus in village chickens. Recently, ADB funds have been used to build capacity and strengthen the central and regional veterinary services to deal effectively and efficiently with outbreaks of avian influenza. Technical assistance has been provided (short missions by international consultants and support of a national consultant for 14 months) particularly in strengthening laboratory capability to receive and diagnose HPAI including H5N1. Additional inputs, including training, were made to assess and assist the country emergency preparedness, surveillance and emergency response plans for HPAI. Equipment and publications from OIE have been distributed to laboratory and scientific officers within the Department of Livestock Services and the Bangladesh Livestock Research Institute.

USAID also provided almost US$1.4 as immediate technical assistance to strengthen emergency preparedness for HPAI. The main aim is to strengthen surveillance activities, laboratory diagnosis and poultry market survey and biosecurity. An epidemiology unit has been established in the Department of Livestock Services (DLS). Training in the use of PPE and rapid antigen detection kits have been provided to staff. Laboratory equipment and supplies, office equipment and computers has been provided to the department, where FAO has established an HPAI Technical Unit.

This unit is currently staffed by three national consultants (epidemiology and surveillance, laboratory services and diagnosis, and emergency response and training) and two international consultants (a Chief Technical Adviser and an Operations Officer). The unit provides continuing technical advice to the DLS and ensures coordination of material and training inputs from other donors. Specific activities included on-the-job training programmes, procurement of essential laboratory consumables and initiation of active surveillance programmes.

FAO is collaborating with the government and the World Bank in support to a Bank-funded project, which has already been approved by the government and will cover veterinary service capacity building including surveillance, laboratory capacity enhancement, response and communication. Other agencies such as the Japan International Cooperation Agency (JICA) and the Danish International Development Agency (DANIDA) are also supporting laboratory capacity enhancement.

Bhutan

FAO fielded a veterinary mission to Bhutan to review the current surveillance activities and the country's HPAI contingency plan, and to evaluate the capacity and capability of the animal health laboratory system to respond to HPAI outbreaks. In April 2007, the RAP ECTAD regional coordinator carried out a mission to follow up on issues related to the animal health laboratory system and coordinate inputs to a new diagnostic facility being set up under a World Bank project.

Cambodia

The first wave of HPAI in Cambodia (January-May 2004) severely hit smallholder farmers who raise the majority of the country's poultry under subsistence conditions and with

minimal biosecurity measures. The virus had broken out in 22 areas including Phnom Penh as well as in seven other provinces, causing the deaths of more than 28 000 chickens (of which 9 518 were culled). Cambodia has had seven human cases of avian influenza, all fatal. The most recent case was reported in April 2007 near the border with Viet Nam. Most of the people involved were found to have had close contact with sick and dead poultry in rural areas.

The Government of Cambodia has a stamping out policy based on selective culling of infected flocks without compensation. Vaccination is not used as a disease control measure. The Ministry of Agriculture, Forestry and Fisheries (MAFF) has also adopted other administrative measures such as a temporary ban on movement of poultry and its products from countries where there are outbreaks and control checkpoints were re-established.

In collaboration with MAFF, FAO is implementing an emergency programme to control the spread of HPAI. This programme, valued at over US$7 million, is supported by the governments of the United States of America, Germany and Japan. The assistance is directed at strengthening the Bangladesh government's ability and capacity in seven different fields of activity: surveillance; laboratory diagnosis; reporting and response; biosecurity; public awareness and education; socioeconomics and livelihoods, and a supportive and protective legislative environment.

FAO has supported MAFF in developing a National Strategy on HPAI Control and Eradication and Action Plan for Avian Influenza which includes four components: strengthening veterinary services; strengthening surveillance and control; poultry sector restructuring; and public awareness.

The observation and reporting of HPAI outbreaks relies almost exclusively upon village animal health workers (VAHWs) and the animal health hotline at MAFF. FAO has provided extensive training in active surveillance to the 4,725 VAHWs in 19 provinces. Expansion of VAHW training to cover the whole country will be carried out in coordination with Agronomes et Vétérinaires Sans Frontières and CARE. A routine survey has been undertaken in large-scale markets and sentinel monitoring has begun in selected areas based on risk. FAO also supports two animal health hotlines which receive dozens of calls a month.

To improve Cambodia's scope for surveillance for infection through structured sampling of wild birds and domestic fowl in live-bird markets, FAO is expanding laboratory capacity at the National Animal Health and Production Investigation Centre (NAHPIC) to conduct virus isolation on an increased number of samples. FAO provided four incubators to NAHPIC to increase its laboratory capacity to analyse poultry samples for the possible presence of avian influenza virus from 288 to 1 400 eggs through egg inoculation.

In addition to training provincial and district veterinarian staff in field sampling and data input skills, FAO is also supporting the design and implementation of two HPAI surveys on identifying infection in key poultry markets and on proactive surveillance of wild birds. To improve biosecurity in backyard poultry, on-farm demonstration units in backyard poultry husbandry and biosecurity will be carried out, covering all 24 provinces. Training guides on biosecurity and prevention and control of avian influenza at the village level have been produced for farmers and VAHWs.

FAO collaborates with the Academy for Educational Development (AED) and UNICEF to increase public awareness and understanding of the issues and risks associated with

avian influenza. A total of 350 community theatre performances and films were shown in locations in 13 provinces which have poor access to mass media. The drama performances feature 'Super Chicken', the popular icon of the avian influenza campaign, a quiz show with prizes, comedy, karaoke songs and popular stories. Conducted by three theatre NGOs, performances are held in pagodas, schools or other public areas in rural areas and often start with TV spots and karaoke songs on key prevention and control messages. T-shirts were printed and distributed at the community theatre shows. Supported by the governments of Germany and Japan, and USAID, 300 000 leaflets on biosecurity measures and 306 000 posters on key prevention messages developed by AED were reprinted and are being distributed to communities through the VAHW network. USAID and the Government of Germany supported the printing of 10 000 training manuals for VAHWs and 6 000 farmer's guides on biosecurity, respectively.

Before the Khmer New Year in April 2007, FAO launched a public awareness campaign alerting poultry owners, traders and the general public to the risks of contracting and spreading avian influenza. Two TV spots and nine radio spots were produced and broadcast nationwide. In addition, nine public awareness marches on avian influenza were held in high-risk provinces to provide communities with the knowledge and actions they can take to protect their families and their birds from avian influenza. The marches attracted almost 3 000 participants from the villages. T-shirts, banners, and caps were printed and used during the marches. Posters, soaps, gloves and masks were distributed during question and answer sessions that immediately followed the marches.

FAO also supported the printing of 6 000 copies of 'Health Messenger' magazine's special edition on avian influenza for distribution to communities, NGOs, UN agencies and staff of the Ministry of Health and MAFF.

India

In February-March 2006, during the first outbreak of HPAI H5N1 in India, more than 100 000 poultry were culled to control spread of the disease. In an immediate response to the outbreak, the Bombay Natural History Society worked with Department of Animal Husbandry personnel on rapid surveillance in wild birds at one site; however, no wild birds were found to be carrying the H5N1 virus and the primary cause of the outbreak remains unconfirmed. Regular clinical and laboratory-based surveillance activities are continuing across the country.

FAO is implementing a project funded by the United States of America to provide immediate technical assistance to strengthen emergency preparedness for HPAI. The project focuses mainly on strengthening the capacity of HPAI disease surveillance and diagnostic laboratories, and promoting strategies aimed at preventing HPAI from re-emerging in the country and developing into epidemic proportions. Additionally, the project envisages satellite-based studies of the long-distance migration routes of higher-risk water bird species within the country and across their flyways, and of their local movements, habitat use and interaction with poultry at selected staging and wintering sites. These activities will strengthen the capacity of veterinarians and wildlife staff to collect samples for avian influenza surveillance.

Indonesia

Indonesia is one of the countries most severely affected by HPAI in poultry. The ongoing outbreaks in poultry and sporadic cases in humans are a major global concern. The disease was first recognized in August 2003 and officially declared to the OIE in January 2004. HPAI spread rapidly across Java, into Bali, Kalimantan and Sumatra, and in 2006, infected Papua and much of Sulawesi for the first time. HPAI has now been confirmed in 31 of Indonesia's 33 provinces. Following the submission of an HPAI outbreak report for 2006, the OIE has declared HPAI an endemic disease in Indonesia. The negative livelihood impacts of HPAI have been felt throughout the poultry sector, from national to village levels. Indonesia now has the highest human death toll in the world caused by the H5N1 avian influenza virus.

HPAI presents a major challenge to Indonesia because of the size and complexity of poultry production, ranging from intensive commercial production to village and backyard production systems, including a range of species, and also because of the considerable logistics required for effective surveillance and response in 33 provinces across an archipelago.

To address control and, where possible, eradication of HPAI, the Government of Indonesia established a National Committee for Avian Influenza Control and Pandemic Influenza Preparedness (Komnas). This committee, which reports to the Ministry of Public Welfare, comprises among others members from the two key implementing ministries, the Ministry of Agriculture and the Ministry of Health, and the high-level involvement of other supporting ministries including Internal Affairs, Transport, and Communications and Information, as well as representatives from the police force and the military.

The Government of Indonesia's National Strategic Work Plan (NSP) for the Progressive Control of Highly Pathogenic Avian Influenza in Animals contains nine key elements: 1) campaign management; 2) enhancement of HPAI control in animals; 3) surveillance and epidemiology; 4) improved and strengthened laboratory services; 5) national animal quarantine services; 6) legislation and enforcement; 7) communication; 8) research and development; and 9) industry restructuring. FAO is assisting Indonesia in the control and eradication of HPAI through an Avian Influenza Control Team based at the Directorate General of Livestock Services (DGLS) and at the FAO office in Jakarta.

With total funding of more than US$24 million from USAID, AusAID and the governments of Japan, the Netherlands and Norway, FAO is working in close collaboration with the Ministry of Agriculture to provide technical assistance through a range of projects aimed at early detection, reporting, increasing the understanding of HPAI epidemiology and control of the disease.

Good progress has been made in disease detection through the FAO-initiated Participatory Disease Surveillance and Response (PDS/R) programme. However, controlling and reducing the incidence of HPAI still remains a big challenge. PDS capacity has been established in 14 local disease control centres (LDCCs), including 114 districts on the Island of Java, 34 on Sumatra (all of North Sumatra and Lampung provinces) and nine on Bali. PDS/R teams have been trained and are active in four provinces on Kalimantan and six provinces on Sulawesi. In total, there are 615 PDS, 600 PDR and 26 combined PDS/R officers working in the field. The current PDS/R project is supporting the Ministry of Agriculture to empower communities and strengthen veterinary services to plan and implement HPAI prevention

and control activities. The consultation and implementation process facilitated by the PDS/R project is supporting the development of effective linkages among national, provincial and district authorities.

Indonesia is the country where the risk of a pandemic developing is at its highest, so urgent and decisive action is required. A combination of measures is required to interrupt sustained virus transmission chains. FAO has already started work to look into the potential roles of live bird markets, commercial poultry sectors and ducks. In Bali, Jakarta and Medan, market chain studies have started, a livelihoods study is under way in Jakarta and new socioeconomics projects and public-private partnerships are being developed.

These activities have resulted in the development and implementation of a strong socio-economics programme in support of HPAI control, which is supported by the DGLS HPAI Campaign Management Unit and by the private sector. The FAO programme is coordinated in such a way as to complement activities planned under a World Bank avian influenza project, which contains a support component to Komnas on compensation and another focusing on an industry restructuring study.

FAO has participated in live bird market workshops conducted by USDA in Medan, Denpasar, Surabaya, Makassar and Lampung. During these workshops, poultry movements in selected 'wet' markets were mapped and participants discussed ways to address identified high-risk practices. One of the outcomes of the workshops was the nomination of a workshop participant to coordinate writing of a funding proposal for improvements in one market in each province to develop a 'model market.' A national workshop to follow-up on these regional workshops is planned. The joint WHO/FAO project to develop an environmental sampling tool in live bird markets is being implemented. The initial studies are being carried out in West Java.

Funding has been provided by the Government of Norway to strengthen biosecurity among commercial poultry farmers in Bali. The project aims to increase awareness and willingness to implement appropriate biosecurity practices by small-scale poultry farmers. A four-year Australian Centre for International Agricultural Research (ACIAR) project has also been designed to strengthen biosecurity in the non-industrial commercial sector.

FAO works closely with its UN counterparts, the National Committee for Avian Influenza Control and Pandemic Influenza Preparedness, the Ministry of Agriculture, the Ministry of Health and the Ministry of Communication and Information as well as NGOs in developing information material to raise public awareness of the disease and to reduce the risk of avian influenza transmission in both the poultry population and humans.

FAO's Information, Education and Communications (IEC) team has also made significant progress in improving the quality of communication activities associated with HPAI prevention and control. The team developed IEC messages for small-scale producers and backyard poultry farmers and story lines for new PDS/R flip charts, story cards, disease cards and personal protective equipment (PPE) use instructions. The IEC team also started a communication campaign in Bali using commercial and community radio stations to raise community awareness of HPAI and appropriate disease mitigation measures that could also be relevant for controlling other diseases prevalent in poultry and to increase productivity.

Through OFFLU, FAO has developed a project to assess the efficacy of current vaccines, monitor changes in the virus and identify new seed strains as necessary.

On another front, FAO is also focusing on efforts to control HPAI in the commercial poultry industry. FAO is supporting the Ministry of Agriculture to further engage commercial poultry producers, as well as to better understand Indonesian poultry production systems in general. Better understanding of and engagement with poultry producers in all sectors are fundamental to the success of the overall HPAI control programme.

The FAO country team is assisting the government in coordination and development of bilateral projects. There has been significant donor support in a number of key areas – for example, laboratory diagnostic services have been supported by AusAID, USDA, JICA, ACIAR, Netherlands, Singapore and China, and further support is expected from Germany.

Lao People's Democratic Republic

The capacity to address the HPAI threat in the Lao People's Democratic Republic (PDR), where there are only a small number of qualified veterinarians, is limited. FAO is assisting the government in an effort to train a large number of grassroots-based village veterinary workers (VVWs) to enable surveillance and increase biosecurity awareness and practice on a broad scale, while at the same time building a response capacity to address outbreaks should they occur. This village-focused approach is warranted by the fact that in Lao PDR 85 percent of the poultry population is raised in backyard production systems.

To date, there have been two confirmed H5N1 epidemics in the country; the first in January 2004 in 42 commercial farms and three villages in the provinces of Vientiane Capital, Champasak and Savannakhet, and the second a small outbreak in July 2006, confined to one state farm in the neighbourhood of Vientiane. The largest epidemic occurred in February-March 2007, involving both commercials farms, particularly free-roaming duck enterprises, and backyard farms in 34 locations. This was also the first occasion on which human cases were identified in the country – two, both of which were fatal.

During this last epidemic, stamping-out was conducted within a one-km radius of the infected points. A high-surveillance zone was declared in which movement or trade of poultry was banned and poultry closely monitored. With most of the cases concentrated in a number of villages of Vientiane Capital, the governor issued a decree ordering the culling of all poultry and the destruction of poultry products in a "red" zone (affecting 211 villages in six of the nine districts), and a ban on moving poultry and hatching eggs. In total, some 350 000 birds were culled and over half a million eggs destroyed. Affected farmers were given compensation at 60 percent of market value.

In collaboration with the UN Country Team, the Government of Lao PDR has prepared a 'National Avian Influenza Control and Pandemic Preparedness Plan 2006-2010' to prevent and combat possible outbreaks of avian influenza in animal and human populations. A National Avian and Human Influenza Coordination Office (NAHICO) was established in 2006 under the Prime Minister's Office, responsible for coordination and collaboration, planning and finance, monitoring and evaluation, and procurement in all HPAI-related issues.

FAO works from within the National Animal Health Centre of the Department of Livestock and Fisheries (DLF) of the Ministry of Agriculture and Forestry in combating HPAI, building on a collaboration which started as early as 2004, when HPAI emerged in neigh-

bouring countries. This work is coordinated under the umbrella of NAHICO and involves close collaboration with other government agencies and NGOs. The current FAO portfolio on avian influenza in Lao PDR consists of three major projects valued at US$6.8 million through financial assistance from the governments of the United States of America, Germany and Japan.

Since HPAI is not believed to be endemic in Lao PDR, the HPAI strategy developed by the government with the support of FAO is based on three main pillars: (1) limiting the possibility for the development of HPAI reservoirs through biosecurity and public awareness, (2) identifying possible HPAI outbreaks through active and passive surveillance, and (3) developing the necessary capacity for a rapid response in the event an outbreak is identified. The fight against HPAI is seen as an entry point for building the capacity of government counterparts from the national down to the community level. An intensive training programme has been developed to train provincial and district DLF staff as well as VVWs at the community level. In this way, a network has been built that has augmented livestock and veterinarian capacity.

FAO has been assisting the government in drafting a number of decrees which should eventually lead to veterinary legislation, is supporting the strengthening of regional cooperation by facilitating the holding of and participating in regional meetings and workshops and, in the longer-term, is working together with the World Bank on upgrading the Laboratory of the National Animal Health Centre and developing a national veterinary curriculum.

Since January 2006, more than 2 300 VVWs have been trained throughout the country (with more than 600 VVWs trained in disease surveillance), more than 600 farmers trained on biosecurity issues, and 260 provincial and district staff trained on technical avian influenza response issues. FAO has provided US$280 000 to support laboratory activities, including the purchase of equipment and supplies, and distributed training and equipment to staff at border checkpoints. FAO is helping to upgrade laboratory systems to strengthen disease surveillance, is working to enhance knowledge of biosecurity and prevention of animal disease, and most recently has begun to assist the government in assessing socio-economic factors and assessing the potential livelihoods impact of control actions, in order to review its contingency plans.

In collaboration with UN agencies, mainly WHO and UNICEF, and with international organizations such as the Academy for Educational Development (AED) and CARE, FAO has developed and distributed a range of information, education and communication (IEC) materials adapted to the special context of Lao PDR and focusing on raising awareness on HPAI, the need for biosecurity, risks and prevention measures. Material targeting smallholder poultry farmers has been distributed in all 17 provinces using a combination of public awareness activities, World Food Programme food distributions, the Lao Women's Union and local administrations. This include 32 000 posters, 3 500 calendars, 120 000 low-literacy booklets and 5 500 CDs (including TV and radio spots and traditional songs on avian influenza) and over 10 000 T-shirts and jackets with HPAI awareness messages. These messages were also distributed using public announcements in markets, and on radio and television.

Mongolia

Mongolia has a significant role to play in understanding the global epidemiology of H5N1 since it lies along three of the most important wild bird migratory pathways in Asia. Wild birds are largely isolated from Mongolia's small but growing poultry industry, and therefore provide a unique opportunity to assess the role of wild birds in long distance spread of the disease.

FAO has deployed a chief technical advisor (CTA) to Mongolia. The initial priority for the CTA was to assist the government, in cooperation with WHO and the UN Development Programme (UNDP), to finalize the National Strategy for Avian and Human Influenza. This is now completed, and forms the basis for a coordinated programme involving the key sectors of emergency management, animal health and human health. In addition, due to the importance of wild bird surveillance, the environment and ornithology sectors have been included in the strategy, which is now being employed by the government to attract further funding for avian and human influenza activities.

Wild bird surveillance has been the priority activity. A broad nationwide surveillance programme has been conducted, monitoring 47 of the most important lakes for dead and sick birds. Data is also being collected on number and species of wild birds, so that the programme is contributing not only to understanding H5N1, but also wild bird migration in general. Diagnostic and epidemiology capacity is being strengthened, as well as capacity in ornithology and understanding of the links between wild birds and local human populations.

Mongolia has a small but growing poultry industry. The government has banned imports of poultry from China, and sponsors a vaccination programme for all domestic poultry. FAO is assisting the government in developing contingency plans and training programmes for the small poultry sector in monitoring and evaluating the vaccination programme. Standard operating procedures (SOPs) are being established for surveillance, investigation and response activities in both wild birds and poultry, and FAO continues to take a strategic approach through promoting cross-sector coordination. FAO cooperates closely with UNICEF, which continues to fund a large awareness programme on H5N1, and with the Wildlife Conservation Society (WCS), which are supporting wild bird surveillance activities through the capture, marking and sampling of live wild birds in high-risk lake areas.

Myanmar

Although most donors do not provide direct funding in Myanmar, FAO has mobilized resources from several donors to assist the Government of Myanmar in containing avian influenza outbreaks. The first outbreaks occurred in February 2006 and outbreaks reappeared in late February 2007 within the capital city Yangon.

FAO is supporting the Government of Myanmar's National Strategic Plan for Highly Pathogenic Avian Influenza Control through three projects totalling US$1.64 million. FAO is also finalizing a project proposal for funding under a World Bank HPAI grant. FAO has provided laboratory equipment and supplies, test kits, reagents and other field supplies for surveillance and response efforts. Training on surveillance and response and biosecurity has also been carried out for staff within the Livestock Breeding and Veterinary Department.

Nepal

FAO is starting activities under a new project to provide immediate technical assistance to strengthen emergency preparedness for HPAI. The project will focus mainly on strengthening the capacity of HPAI disease surveillance and diagnostic laboratories, containing any eventual outbreaks of HPAI and improving biosecurity measures. Additionally, a socioeconomic assessment will be carried out along with a communications and public awareness campaign.

The People's Republic of China

FAO is spearheading efforts to strengthen China's veterinary services to prevent and control avian influenza "at source" through increased surveillance, detection and early response to outbreaks. Through its technical cooperation programme (TCP), FAO has supported the Government of China since the beginning of the avian influenza epidemic in 2004, when the first outbreak was declared in the country. HPAI activities in China include a project funded by USAID: Immediate technical assistance to strengthen emergency preparedness for Highly Pathogenic Avian Influenza (HPAI)", focusing on selected laboratories in Tibet, Qinghai and Xingjiang provinces, which have experienced outbreaks in domestic poultry and in wild birds. The project is supporting HPAI outbreak investigation techniques, disease surveillance and disease information analysis capacity within the Animal Health and Epidemiology Centre of the Ministry of Agriculture.

Furthermore, diagnostic equipment and material have been provided, advice given on appropriate set-ups for provincial laboratories and transport containers furnished to enable the submission of samples to the National Reference Laboratory for diagnosis. In addition to a senior Chinese technical expert already in place, a senior international technical adviser joined the FAO national HPAI team in the FAO Beijing office in June 2007. FAO will also manage a third phase of the USAID-funded project to extend technical activities in two southern provinces of China where the disease is endemic and likely to be the source of repeated outbreaks.

The Philippines

The dependence of rural communities on poultry extends throughout the Philippines. It is a source of food and income for rural villagers. On the other hand, the commercial sector in the country is firmly established and an outbreak of H5N1 would devastate the poultry industry. FAO, with financial support provided by the Government of New Zealand, is assisting the Government of the Philippines in its efforts to continue HPAI surveillance and strengthen veterinary service capacity, especially in field and diagnostic surveillance of HPAI and other diseases that may emerge in the future.

Sri Lanka

Although Sri Lanka still remains HPAI-free, the poultry industry has been facing a severe economic burden due to lack of consumer confidence in national poultry products. A strong veterinary service system for diagnosis and surveillance of HPAI is essential to maintain consumer confidence on a sustainable basis. FAO is complementing the Government of Sri Lanka's national capacity for early detection and early response of HPAI to keep the disease out of domestic poultry and prevent establishment, spread and development to

epidemic proportions of HPAI after entry, through synergistic strengthening of early warning and early reaction capacity.

Timor-Leste

While Timor-Leste is still free from HPAI, its nearest neighbour, Indonesia, has seen the disease reach endemic proportions. Timor-Leste may only be a relatively small part of a large archipelago, but it has smallholder farming systems that are often characterized by close contact among people, poultry and other animals. Since 2005, FAO has provided support to the Government of Timor-Leste in community efforts to prevent and control HPAI and other serious animal epizootic diseases. A Rapid Preliminary Assessment on Prospects for Early Detection and Rapid Response to HPAI was conducted in November 2005. A mission on disease surveillance and control to guide development of an emergency preparedness plan for HPAI was conducted in January 2006. A three-year US$ 4.8 million programme was submitted to the government and presented to donors in February 2006. USAID has already provided initial funding for the public awareness and communications component, and implementation started in July 2006.

The awareness and communications component will help protect the livelihoods of the rural and peri-urban population and safeguard animal and human health by educating people about HPAI, as well as hygiene and food safety. Messages are being disseminated through various channels, such as posters, brochures, T-shirts, jingles and radio/TV programmes. The HPAI awareness and public communication campaign was successfully launched in five main districts (Bobonaro, Cova-Lima, Aileu, Oecussi and Lautem), and that was followed by the national launch in Dili in May 2007.

The poultry disease control and surveillance campaign has also increased contact among staff at the Directorate of Livestock, poultry farmers, poultry traders, NGOs and community-based organizations (CBOs). Due to the security situation in Timor-Leste, no active surveillance of avian influenza is possible at the moment, but with support from FAO, the Ministry of Health is carrying out animal disease reporting via village livestock workers (VLWs) to the community health post.

FAO also assisted in strengthening the capacity of the Government of Timor-Leste by providing HPAI prevention and control training for national and district livestock staff, quarantine services staff and VLWs from districts bordering West Timor Territory in Indonesia. Avian influenza investigation teams were established with the assistance of FAO. A series of special HPAI public awareness and communication workshops were organized by FAO, targeting NGOs, CBOs and mass media in order to widen the outreach of awareness campaigns. A table-top simulation exercise was conducted in collaboration with the Ministry of Health, the Ministry of Agriculture, Forestry and Fisheries (MAFF), WHO and FAO. By December 2006, FAO and MAFF had produced a Manual for the National Investigation and Response Team for Avian Influenza in Animals.

USAID has already committed funds worth USD 500 000 to continue awareness-raising activities. A new three-year biosecurity project to strengthen the government's capacity for the prevention and control of HPAI, which AusAID is supporting with funds worth USD 3.75 million, will commence in December 2007, with the aim of establishing a framework for animal disease control. The project will be implemented entirely by MAFF.

Viet Nam

Viet Nam was one of the first countries to be severely affected by the influenza H5N1 epidemic. In the first wave, outbreaks of HPAI affected nearly all parts of the country. Since three consecutive waves of outbreaks between 2003 and 2005 and starting in September 2005, mass vaccination campaigns have been implemented every six months. For almost one year, no outbreaks were reported but between December 2006 and February 2007, 12 southern provinces were infected and the latest series of outbreaks which began in May 2007 has affected 22 provinces, mainly in the north. In 2007, the Department of Animal Health officially reported 260 outbreaks on its website[7], with about 130 000 poultry dead or culled in the affected provinces. To date, a total of 100 human cases have been reported in the country, with 46 fatalities.

The National Strategy for HPAI Control of the Government of the Socialist Republic of Viet Nam is described in the 'Integrated National Operational Programme for Avian and Human Influenza (OPI) 2006-2010' or the 'Green Book'. The government continues to implement control measures which include stamping out (which has been modified from a policy of culling all birds within a three-km radius, to the culling of directly affected poultry flocks), movement control and vaccination of chickens and ducks around areas where outbreaks have been reported.

Since the first official reports of disease in Viet Nam in January 2004, FAO has been supporting the government by providing technical assistance and policy recommendations and continues to provide support for implementation of the National Strategy for Prevention and Control of HPAI. Assistance of US$7.4 million and ongoing additional assistance of US$6.7 million has been provided by the governments of Japan, the United States of America and Ireland, and from the 'Joint Government-United Nations Programme to Fight Highly Pathogenic Avian Influenza'.

FAO is continuing to work with the government in the transition from an 'emergency' phase to the 'consolidation' phase, in capacity building to strengthen veterinary services within the Directorate of Animal Health , and to provide technical assistance to the Department of Livestock Production (DLP).

Through the Japanese Trust Fund project, FAO is piloting new approaches to HPAI surveillance and response in four provinces. Specifically, telephone hotlines have been promoted with publicity materials to stimulate farmers to report poultry mortality. Active surveillance is being done through a community-based approach. Outbreak response capacity is being enhanced through the use of new report forms and laboratory sample submission is being supported. All these elements are supported by a comprehensive training programme.

At central level, FAO is also working with the government in veterinary epidemiology training and improved disease surveillance, including technical support for TAD-info®, the FAO open-source programme that has been adopted by the government as the official disease reporting system.

FAO is assisting the government with strategic recommendations on vaccination, including post-vaccination surveillance and monitoring. The first round of the avian influenza

[7] See www.cucthuy.gov.vn

vaccination campaign in 2007 covered 63 provinces, vaccinating a total of 164.47 million poultry (87.42 million chickens, 73.15 million ducks and 3.90 million Muscovy ducks). The second vaccination campaign for 2007 is currently under way (November 2007), with special attention being paid to the hatching of waterfowl, particularly ducks, in order to ensure that new-born birds are immediately vaccinated as part of the national campaign. FAO has recently procured vaccine cold-chain equipment for 12 provinces with high poultry densities, and procurement for an additional 27 provinces is under way. An expert mission on feasibility of local H5N1 vaccine production has been completed.

Another area of intervention is the 'restructuring' of the poultry sector in the medium to long term, with a particular focus on small-scale and backyard farms. FAO is helping the government explore the most effective measures to promote biosecurity, especially for free-grazing duck production systems, and to encourage the poultry industry and provincial governments to adopt appropriate regulatory measures.

FAO, in collaboration with UN counterparts and other international partners, is also working on development of information, education and communication (IEC) activities and materials for raising awareness on safe poultry handling. In particular, FAO is developing strategies to involve veterinarians, para-veterinarians and frontline agricultural workers in risk communication messages related to prevention and control of HPAI, especially when interacting with farmers in the areas of disease surveillance, disease investigation, disinfection, culling and vaccination.

FAO and the government have plans for applied research in several areas, including H5N1 vaccine efficacy trials (to ensure that the vaccines used are still protective against currently circulating H5N1 virus strains), wild bird surveillance and traceability schemes in pilot smallholder poultry farming areas (in which individual birds are tagged at the farm gate, prior to their movement into the market chain).

FAO continues to participate with the government and other partners in meeting the objectives outlined in the 'Green Book'. The Country Strategy and Work Plan for 2007-2010 on HPAI Control and Eradication in Viet Nam has been developed with FAO's support. The vision of the strategy is to achieve a situation where the development of an H5N1-based human influenza pandemic no longer represents a threat for the country by the end of 2010.

Sub-Saharan Africa

The FAO HPAI programmes in Africa are implemented in close collaboration with the following institutions:

- African Union-Interafrican Bureau for Animal Resources (AU-IBAR);
- OIE and WHO;
- OFFLU diagnostic reference laboratories and epidemiology collaborating centres, Centre de coopération internationale en recherche agronomique pour le développement (CIRAD) and the Royal Veterinary College (UK); and
- organizations involved in wetland management and wild bird conservation including Wetlands International and Birdlife International.

To complement HPAI activities carried out under TCP projects for Eastern and Southern Africa, USAID committed financial support to FAO for a regional project in Southern Africa.

The project, which began in March 2006 and ended in 2007, aimed to identify priority actions for the region, strengthen the capacity of Southern African countries to detect HPAI in the region, and share the information within and beyond the region for use in revising and updating national and regional emergency preparedness plans. The project sought to achieve these goals by improving coordination among countries and international organizations and agencies, and upgrading field surveillance and laboratory diagnosis capacities at regional level.

The project was launched with a regional workshop on HPAI held in Pretoria, South Africa, and attended by representatives of animal and human health services from the Southern African Development Community (SADC) member countries (Angola, Botswana, Democratic Republic of the Congo, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Lesotho, Swaziland, Tanzania, Zambia and Zimbabwe), the Food, Agriculture & Natural Resources Directorate of the SADC Secretariat (SADC FANR), the AU-IBAR Director, representatives of FAO and other United Nations agencies, NGOs and operators from the private sector. A further regional training workshop on field surveillance was held in Pretoria in January 2007.

Following the launch of a TCP project for Central and Western Africa in January 2006 in collaboration with L'Union Economique et Monétaire Ouest Africaine (UEMOA) and covering 18 countries [8], additional SFERA funds have been used to enable the participation of a further seven countries [9].

FAO now has four Regional Animal Health Centres (RAHCs) in the region: Bamako for West Africa, Nairobi for Eastern Africa, Gaborone for Southern Africa and the Indian Ocean islands, and Tunis for North Africa. Much activity has been dedicated to consolidate technical services coordinated from these sub-regional hubs. In October 2006, a training of trainers (TOT) workshop was held in Dakar, Senegal, and attended by 29 participants from 16 countries. The workshop was jointly conducted by technical personnel from EISMV and staff from AU-IBAR, FAO and Wetlands International, and covered avian influenza epidemiology, diagnostic, surveillance, control and strategic communication.

In November 2006 in Senegal, 16 countries in the region took part in an HPAI outbreak simulation exercise. This was organized by CONAGA (*Comité National de Lutte Contre la Grippe Aviaire*) in order to test the effectiveness of the national plan for controlling an avian influenza outbreak involving domestic and wild birds. More than 120 people participated in the exercise including veterinary workers, wildlife experts, health professionals and other officials. FAO contributed US$27 400 to this meeting, during which a documentary DVD of the simulation exercise was produced.

SFERA funds have been used to develop and implement a project in collaboration with EISMV, which is based in Dakar, Senegal. The aim of the project was to produce a toolkit to be used to increase public awareness of the dangers posed by HPAI to animal health by communicating key messages about the disease. The toolkit was produced in French on a

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[8] Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Congo, Côte d'Ivoire, Gambia, Ghana, Guinea Bissau, Guinea Conakry, Mali, Mauritania, the Niger, Nigeria, Senegal, Sierra Leone and Togo.

[9] Burundi, .Cape Verde, the Central African Republic, the Democratic Republic of the Congo, Equatorial Guinea, Gabon, Rwanda and Sao Tome and Principe.

CD-ROM and is being distributed through FAO country offices to 29 francophone beneficiary countries in Africa and the Indian Ocean. The CD-ROM includes several different information tools, including audio and video recordings, textual aids, posters, training guidelines and presentation material. Two hundred copies of the CD-ROM have been produced with SFERA funds. The CD-ROM targets primarily those working on national HPAI campaigns, including technicians and animal health workers.

FAO has also been working in Africa on disease assessment and its experts have carried out more than 350 days of field missions to analyse the disease situation, assess the capacity of veterinary services, consider country needs, assess the performance of national laboratories and review emergency plans. In particular FAO personnel have been actively involved in assisting countries in drafting HPAI emergency and contingency plans and SOPs for HPAI outbreak management.

In HPAI-infected countries, FAO staff and consultants have provided technical and policy advice, strategy design and assistance in line with FAO/OIE recommended guidelines for HPAI control. In particular, during these field missions, technical assistance was given to the national veterinary services of Burkina Faso, Cameroon, Côte d'Ivoire, the Niger and Nigeria in outbreak control activities. In all countries visited, a funding matrix was designed for emergency action and subsequently used by the local FAO Representations in discussions with donors.

In order to better understand disease behaviour on the continent and to identify risk factors, a continental epidemiological study has been prepared. A launching workshop with concerned countries was held in April 2007 in Cairo; and in the framework of the wildlife surveillance component of the FAO Global Programme, several missions were carried out in African countries during which wild birds were captured and fitted with radio-transmitters.

COUNTRY HIGHLIGHTS

Angola

A project has been implemented in Angola to improve the preparedness capacity of the government in the event of an outbreak of HPAI. The project aims to improve HPAI surveillance capacity in domestic poultry and migratory birds and establish trained emergency response teams that are adequately equipped for urgent intervention in the case of an HPAI outbreak. The project also focuses on public awareness of biosecurity measures as an effective tool against HPAI.

Chad

An important programme to strengthen the veterinary service's capacity to address the avian influenza threat and other transboundary animal diseases is being prepared with technical and financial support of FAO. The European Commission will be the major donor. AU-IBAR, FAO and OIE organized a joint meeting at Ndjamena, Chad, in February 2006 on evaluation of veterinary services policies and role of livestock breeders in the surveillance of animal diseases. The meeting advised Chad and other countries on how to prepare national animal disease preparedness plans.

Côte d'Ivoire

Activities have focused on support to the government for the implementation of a targeted vaccination campaign (including mainly the purchase and supply of 12 million doses of Gallimune vaccine). This is framed within a multi-donor programme that includes activities such as raising awareness among poultry producers, provision of equipment to the national veterinary laboratory and epidemiological surveillance in markets, borders crossing points and transport routes. Several advisory missions have been carried out by FAO experts. Recent outbreaks in neighbouring Ghana have put avian influenza back on top of the political agenda as highlighted by the May 2007 decision to make preventive vaccination compulsory in areas located near the borders with Ghana and Burkina Faso.

Ethiopia

Poultry occupies a unique position in terms of its contribution to the provision of high quality protein food to rural smallholder farming families in Ethiopia. The introduction and spread of the disease could result in flock mortalities of up to 100 percent in the case of the H5N1 subtype, resulting in losses of income and a negative impact on the livelihoods of millions of smallholder farmers. Free-range chickens are kept as scavengers or in backyards in the poultry sector in Ethiopia; this increases the risk of infection through the transmission of the disease from wild birds to domestic chickens.

A FAO project, with donor support from the United States of America and the United Kingdom, is being implemented to assist national authorities to strengthen capacity to rapidly detect any introduction of HPAI into the country and stop its spread in the case of its occurrence. The specific objectives and activities of the project support the National Emergency Preparedness Plan by seeking to strengthen capacity for disease surveillance and laboratory diagnosis, to improve public awareness and information, to develop emergency preparedness plans for HPAI and to undertake a comprehensive assessment of the social and economic impact of an outbreak of HPAI.

In order to strengthen technical capacity, regular systematic active and passive surveillance activities have been initiated in commercial and smallholder poultry farms. Active surveillance in wild birds has also been carried out in all parts of the country. Specific animal health policies and SOPs have been developed to address HPAI. More than 8 000 laboratory specimens were collected and submitted to the National Animal Health Research Centre (NAHRC) from various parts of the country where cases of HPAI were suspected. In four instances, specimens were sent to reference laboratories. In all cases, the diagnosis was negative for HPAI.

Technical training on improved diagnosis techniques was provided to NAHRC and regional laboratory staff, improving the overall institutional capacity to conduct HPAI tests. Based on a letter of agreement signed between the Ethiopian Agricultural Research Institute (EARI) and FAO, financial support was provided to NAHRC to enhance its capacity for HPAI surveillance, diagnostics and training. Local and international procurements were made, providing the necessary equipment, vaccines, chemicals, reagents, disinfectants, protective gear and other items to NAHRC and regional laboratories. A major rehabilitation of the avian influenza laboratory at NAHRC was undertaken and the laboratory will have a Biosecurity Level 2 (BSL2) to handle other TADs. The creation of a national dynamic interac-

tive TADs database system with risk analysis capabilities is completed and currently being tested. FAO contracted CIRAD (France) to undertake an HPAI risk analysis study. This study was based on a phased approach and recently completed. An international consultant conducted a biosecurity assessment of the country and provided practical recommendations for the prevention of HPAI. This work is being pursued by a national consultant.

FAO co-sponsored a conference organized by the Ethiopian Veterinary Association on 'The threat of avian influenza to Ethiopia: Implications for health, national economy and policies'. Over 500 veterinarians drawn from all over Ethiopia attended. Seven training of trainers (TOT) courses, involving a total of 150 participants, were organized to help provide farmers, poultry traders, students and other stakeholders with basic information on avian influenza and ways of preventing and controlling the disease. Representatives of 54 NGOs, most of them working in rural development, took part in a consultative workshop and pledged to participate actively in disseminating avian and human influenza information. About 140 journalists drawn from the federal and regional media agencies – both government and private – were trained in risk communication in two rounds to help the prevention and control of avian and human influenza, resulting in various messages disseminated through different media outlets in different local languages. More than 20 staff of Voluntary Service Overseas Ethiopia drawn from six regions in Ethiopia participated in a sensitization programme to enable them to spread avian influenza messages during their work in the field. More than 150 000 posters containing avian influenza communication messages in six different languages (Amharic, Oromiffa, Tigrigna, Somali, Afarigna and English) were printed and distributed throughout the country and 200 000 copies of a brochure (in Amharic) were disseminated. Twenty-five weekly avian influenza activity reports were produced and distributed widely in and outside the country.

FAO has provided considerable support to the government in the development of its three-year national plan. FAO contributed to the preparation of a policy document to implement the plan. The policy was prepared on the basis of the recommendations in an FAO position paper (2004) and minimum guidelines and requirements for HPAI prevention and control set by OIE, FAO and WHO. FAO developed a manual of SOPs for HPAI prevention and control in Ethiopia. The manual covers the animal health component: biosecurity, movement control, surveillance and diagnosis of avian influenza, culling of poultry, disposal of carcasses and potentially infective materials, vaccination of poultry and compensation. Based on the SOPs, two training manuals were prepared for use by personnel who would be involved in poultry vaccination, culling and disposal of carcasses and contaminated materials.

A livelihoods assessment of the social and economic implications of an outbreak of HPAI was commissioned. The results of this study were valuable in the development of a compensation policy, designed to address the commercial and backyard poultry production sectors. This policy was approved by the National Avian and Human Influenza Coordination Committee. Detailed guidelines for the implementation of the compensation policy were developed.

Great Lakes (Burundi, Democratic Republic of the Congo, Rwanda)

A regional operation to address transboundary animal diseases (TADs) in the Great Lakes of Africa funded by the Government of Belgium was recently launched in a sub-regional

context characterized by past conflicts. The inception workshop that took place in Goma in March 2007 offered a unique opportunity for specialists and decision-makers from the three countries to agree on common strategies and develop networks of collaboration.

Kenya

FAO contributed to the finalization of a national preparedness plan for Kenya, a process led by a multi-stakeholder task force formed in October 2005. It was formulated along FAO/OIE/WHO guidelines and developed with inputs from national ministries, international organizations, private sector groups and NGOs. The issues addressed by the plan include epidemiology and surveillance, disease control strategies, laboratory diagnosis and research, information, education and communication. The main objectives of the plan are to strengthen the influenza surveillance network, assess the impact of influenza and benefits of prevention and control, generate a national action plan for avian and human pandemic influenza preparedness and develop policies for influenza vaccine and anti-viral usage during influenza pandemics.

The capacities developed through ECTAD's work on HPAI enabled FAO to provide swift and efficient support to Kenya during a Rift Valley fever outbreak. An HPAI project is currently being implemented.

Malawi

Through a USAID-funded project, FAO supported the efforts of the Malawi National Technical Committee on Avian Influenza (NAITC) to strengthen surveillance of wild birds (primarily in wetlands) and domestic birds, focusing in particular on the interactions between the two. The NAITC also facilitated meetings with government ministers, donors and NGOs, in line with the Malawi Avian Flu Implementation plan, in order to mobilize resources and initiate activities. The purpose of the project was to reduce the dangers to human health through the strengthening of national capacities to rapidly detect and control HPAI in the event of introduction to the country. The project was designed to strengthen an epidemio-surveillance network in order to deal with the HPAI threat, establish rapid response field surveillance and develop a reporting system.

Under the project, three multisectoral rapid response teams (RRTs) were equipped with the necessary veterinary supplies, transport and training. A comprehensive and detailed RRT manual was completed and published for the use of the teams and other stakeholders. The RRTs investigated four possible cases of HPAI, all of which tested negative. In October 2006, animal health authorities completed a surveillance plan of wild birds in all regions, taking 1 500 samples, of which 251 were tested due to a shortage of antigen. As part of wider efforts to improve animal health surveillance in Malawi, the project included a vaccination campaign for Newcastle disease in certain high-risk areas, under which more than 220 000 birds were vaccinated.

A multisectoral conference on the major risk factors for the transmission of HPAI to humans and domestic poultry was held in February 2007 with the participation of concerned ministries, NGOs, donors and the private sector. It was agreed that continuous attention should be paid to the two main possible routes of introduction of HPAI: migratory wild bird flyways and legal or illegal trade of poultry across national borders.

The Niger

In February 2006, the same month that H5N1 first appeared in Africa in Nigeria, areas along Niger's southern border with Nigeria reported outbreaks in and around Magaria, near Zinder. USAID financed a project worth $US 200 000 to reinforce Niger's weak capacity to face the HPAI, with funds being used to purchase laboratory equipment to improve diagnostic capabilities and train laboratory staff in proper use of materials and techniques. For epidemiological surveillance; additional supplies were provided, including 20 motorcycles to assist in transport in the region, and training sessions held for staff. A monitoring network has been set up within government ministries, to report on surveillance activities at the national, regional and local levels, and materials such as report forms and vehicles were put at the network's disposal. Programme activities were bolstered by a communication campaign highlighting what had been accomplished, including a public awareness campaign in affected regions to educate the population.

Nigeria

Immediately following the HPAI outbreak in Nigeria FAO, OIE and AU-IBAR developed an information kit on HPAI that subsequently went to all African countries as part of public awareness campaigns on the disease. Following confirmation of HPAI infection in February 2006, efforts were concentrated on the launching of a countrywide active surveillance programme, and a consultant veterinary epidemiologist was fielded by FAO. An ECTAD country team has been established in the country to support the national avian influenza control programme and to integrate efforts and complementarities between projects for a more global work programme approach. This country unit will assist national authorities in the identification of country needs and implementation of activities at both local level as well as central level to help control HPAI. The priority areas of work in support of the national HPAI control programme have been identified. These include surveillance, training and capacity building, socioeconomics, biosecurity and communication.

With the support of the European Commission, a protocol for live bird surveillance has also been developed for targeted HPAI active disease surveillance to improve the understanding of the role of live-bird markets in the epidemiology of HPAI in Nigeria, particularly with reference to the sustenance and spread of the disease as well as the degree of risk of human exposure. The first phase of the surveillance study and field activities has been concluded and it showed that disease surveillance covering the entire country is feasible.

Currently field activities in targeted surveillance are under way in one high risk area and will be expanded to cover the remaining areas and live-bird markets, and target surveillance on commercial farms. A Letter of Agreement with the National Animal Disease Information System (NADIS) has been drafted so that FAO can provide funds to NADIS allowing it to improve and strengthen its surveillance data collection and reporting system. To facilitate the reporting for disease investigation, surveillance and treatment of data, the Government of the Federal Republic of Nigeria is currently investigating the possibility of introducing and installing the Short Message Service (SMS) Gateway technology and a free access line for reporting. Studies on socioeconomics and wildlife are under preparation jointly with UNDP and the World Bank. Procurement actions are under way for 50 steel cabinets to be used for storing personal protective equipment (PPE) and for laboratory consumables, equipment and biosafety material.

The Sudan

The Sudan reported its first outbreak of H5N1 highly pathogenic influenza in April 2006, and investigations confirmed outbreaks in Gezira, Khartoum and River Atbara States. In August 2006, an outbreak of H5N1 was also confirmed in Juba, the capital of Southern Sudan. Sudan has a relatively new and expanding poultry industry worth $US30 million per year, with 85 percent of commercial production taking place in Khartoum State. HPAI poses a considerable threat to the nutritional well-being and the livelihoods of the Sudanese population. The Sudanese government combats HPAI through a stamping-out policy in case of outbreaks, as well as assistance in disposal of carcasses and decontamination of infected structures.

With funding from USAID, FAO is establishing a system of community-based surveillance through Participatory Disease Surveillance and Response (PDS/R). The avian influenza PDS/R approach will be modelled on the existing PDS/R system developed by FAO that the Government of Sudan established for the eradication of Rinderpest.

Over a one-year period (1 October 2006 to 30 September 2007), the project implemented PDS/R capability in six states, extended PDS/R capacity through training of trainers and strengthened district-level capacity to coordinate disease surveillance and response within the context of the national strategic plan. Eventually PDS/R activities will be initiated in all states but, because the Sudan is such a vast country, PDS/R poses a particular challenge. Vigilance is extremely important.

Under the auspices of the project, 12 PDS teams and 12 PDR teams are being created. The project also includes three TOT workshop cycles (creating 30 trainers), three decision-makers' training workshops and three local government workshops to integrate districts into the national strategic plan. The TOT workshops cover the general principles of adult learning and introduce the participants to training approaches and methods. The second part of the TOT courses focuses on participatory learning methods that are particularly useful for training veterinarians in PDS/R. Decision-makers' training workshops are designed as training workshops for managers and policy-makers who direct surveillance and response activities. These workshops provide brief hands-on field experience in PDS/R to decision-makers so that they are better prepared to utilize participatory information in policy setting and to manage the programme.

Training in the epidemiology of avian influenza and laboratory techniques was provided to field veterinarians and laboratory personnel from both north and south Sudan. The epidemiology training consisted of basic principles of epidemiology, including disease outbreak investigation, epidemiologic study designs and data manipulations. The training also discussed the use of PDS for data collection as well as disease search among communities. Surveys using PDS methodology were conducted in Juba, Central Equatoria State in Southern Sudan (coordinated by the FAO/OIE CMC/AH) and the report of the PDS exercise was disseminated.

The project partly funded the recruitment of an international consultant with expertise in emergency preparedness and disease control, based in Khartoum from July to December 2006. A USAID staff member based in Khartoum was seconded to FAO in 2006. In February, 2006, an HPAI control team leader for Sudan took up his position, based in Khartoum.

As the project moves towards its conclusion, further activities have taken place, includ-

ing more training in participatory disease surveillance, awareness campaigns and the provision of additional laboratory and veterinary equipment. Training in PDS will be provided to veterinarians from those states identified as high and moderate risk in the National Strategic Action Plan of the Government of Sudan. Moreover, in the southern Sudan states, more PDS/R training will take place, further equipment will be provided, laboratory refurbishment will be carried out and training in diagnostics is planned.

Uganda

With support of US$793 000 from the United States of America, and in partnership with the government, FAO is implementing a project to strengthen the national HPAI action plan, specifically in the areas of surveillance and communication. The main objective of this project is to enhance local capacity for HPAI emergency preparedness planning. Specific objectives are to understand trade patterns and migratory bird movement into and within Uganda, assess the potential risk for domestic poultry; strengthen HPAI field surveillance; and enhance public awareness of risk factors relating to the spread of avian influenza. The project includes the following specific outputs: a compensation policy and guidelines, HPAI guidelines for prevention and control, a contingency plan simulation exercise, biosecurity and hygiene in markets chains and the community, operational rapid response teams (RRTs), and a National Command and Control Centre.

With regard to the production of HPAI guidelines for prevention and control, SOPs and diagnostic manuals were developed and disseminated for surveillance, response, sample collection, clinical and laboratory diagnosis, biosecurity and biosafety, decontamination and stamping out. The Uganda Virus Research Institute funded the printing of these SOPs. Nine regional workshops were conducted for RRTs and technical work groups covering the entire country. Table-top simulations were conducted during all regional workshops.

After an outbreak of HPAI in Southern Sudan, two teams comprising staff from FAO and government officials visited ten districts in Sudan to strengthen their capacity for HPAI surveillance and control, update them on HPAI preparedness and contingency planning and assist them in setting up HPAI task forces and technical working groups. Training has been completed in ten districts in Northern Uganda. TOT was carried out by the RRT training group of the Ministry of Health and was funded by WHO. Seventy-six districts were provided with funds to enable them to carry out primary investigations of poultry disease outbreaks, periodic surveillance of sentinel sites (livestock markets, water bodies, wetlands, rice schemes) and for reporting. Drop-in surveillance was carried out by two teams of government staff in ten districts in western and northern Uganda and 11 districts in eastern Uganda. The teams carried out monitoring and training of district rapid response teams on surveillance, outbreak investigations and reporting. They collected 184 samples from poultry in markets. The samples all tested negative to influenza type A and Newcastle disease. Only one sample from a backyard farming system tested positive for Newcastle disease. All samples were submitted to the government diagnostic laboratory for further tests.

In addition, project funds ensured the purchase of office equipment for the operationalization of the National Command and Control Centre. A Ministry of Agriculture telephone hotline has been in existence since 2007 to facilitate rapid reporting and timely response.

Zambia

FAO has been implementing a US$175 000 surveillance and control project in Zambia funded by the European Commission to increase government capacity in disease recognition and disease control management through designing and implementing an active HPAI surveillance system and a livestock information system for effective disease epidemiology monitoring and reporting.

Middle East and North Africa

Countries and territories under the Middle East and North Africa (MENA) cluster include the Maghreb (Algeria, Libya, Mauritania, Morocco and Tunisia), the Middle East (Egypt, Iraq, Jordan, Lebanon, Syria and the West Bank and Gaza Strip), and the Arabian Peninsula (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, the United Arab Emirates and Yemen). The MENA region is at particularly high risk because of the large wild bird flocks crossing the region, with increased risk of infection spreading among domestic poultry due to movement of poultry, humans and fomites.

Following the HPAI outbreaks in Asia, FAO developed and implemented two regional TCP projects in the MENA region. These projects were developed to assist the countries at risk at that time (some have since reported infections of HPAI) in preparation for the disease and training for disease surveillance and to establish sub-regional epidemiological and laboratory networks in order to build country and regional capacity for HPAI detection and response.

The establishment of RAHCs in Beirut and Tunis will promote and coordinate harmonized regional approaches for early warning and provide technical assistance and advice to regional and national initiatives for HPAI prevention and control. Donor support is needed to help strengthen the operational and technical capacity of these RAHCs to ensure continuity of activity and enable countries to efficiently implement their HPAI control and prevention programmes.

Regional capacity building through training is the focus of the MENA programme. A two-day regional workshop was organized in order to discuss the basic requirements and the strategic considerations for developing and implementing contingency plans and compensation programmes, and improving avian influenza communication. The workshop was attended by more than 30 representatives from 15 countries from the Maghreb, Gulf States, Middle East, Sudan and Djibouti. The workshop was also attended by representatives from OIE, World Bank, the UN Industrial Development Organization (UNIDO), UNICEF and USDA's Animal and Plant Health Inspection Service (APHIS).

A regional training workshop for FAO national staff (from Yemen Jordan, Syria and Lebanon) who are in charge of avian influenza prevention and control activities in their countries, was organized in Amman, Jordan, to assist in strengthening the operational and technical capacity for project implementation.

A Workshop on Contingency Plan Development and a Simulation Exercise was organized to conclude two TCPs launched in North Africa and Middle East in 2005. The workshop was attended by 20 participants, representing 12 countries in the two sub-regions. Egypt was the only TCP recipient country that was not represented, and the West Bank and Gaza Strip was unable to send a representative due to travel/visa constraints. Partici-

pants included Chief Veterinary Officers, epidemiologists and senior planning staff from the countries. The objectives of the workshop were to review progress in HPAI preparedness in the countries, to undertake an HPAI outbreak simulation exercise, to assist in demonstrating key issues for country contingency plans and to identify further assistance required by countries in a follow-up Regional Action Plan. The workshop was conducted over three days.

COUNTRY HIGHLIGHTS

Egypt

FAO, with donor support, is increasing its technical and operational support to help bring HPAI under control. A consultant was recruited for three months to assist the Ministry of Agriculture and Land Reclamation to identify possible improvements to the structure of veterinary services in the country. Recommendations included establishing disease management units, a review of quarantine policy and improving the flow and quality of information from the field to the Ministry of Agriculture and Land Reclamation. A national consultant was recruited to assist the ministry with the implementation of these recommendations.

A field study was conducted in Egypt to assess biosecurity levels in the small-scale and backyard poultry sectors, with the aim of improving these levels as a way of reducing the circulation of the H5N1 virus. A poultry sector analysis was conducted in order to identify the different production systems in the commercial sector. A risk assessment of the role of the sale of live birds in the increased circulation of HPAI was carried out. Research into the value chain has also been conducted in order to understand the factors controlling this market and its biosecurity measures.

An assessment has been made of the compensation measures implemented in Egypt in 2006 for the industrial, large-scale and smallholder producers in the poultry sector. The outcomes indicated that the producers in the industrial sector were the main beneficiaries. However these producers were unhappy with the compensation rates paid for the birds slaughtered during the culling process. More recently, compensation for culling birds has been halted with a negative impact on the reporting of HPAI outbreak cases. To address these problems, the ECTAD socioeconomics group is working with the Economics Section of the Ministry of Agriculture and Land Reclamation to develop a compensation policy that is adequate for both public and private sectors.

In order to identify institutions involved or influential in the decision-making process, a study was commissioned at the Egyptian Academy of Sciences to assess the influence of its research results on the government's HPAI control policy. A similar study within the public and private sector was initiated to identify possible partners to work with as part of the overall plan to reduce the circulation of the virus. The results of this study will be available by the end of 2007.

Smallholder poultry production systems are an important livelihoods component for the majority of rural households (80-90 percent) and many urban families. In order to understand how HPAI and its control has affected the ability of these households to use poultry as a component of their livelihood strategies, FAO has been working with the World Food Programme (WFP) to investigate the impact of this disease in four governorates in the south

of the country. Initial results indicate a very large negative impact since the disease was first declared. There are clear indications that smallholder producers are facing severe problems in rebuilding their poultry flocks. Preliminary results from this work have been presented in Cairo and final results will be available in December 2007.

Due to the continuous spread of HPAI in Egypt, ECTAD is setting up a dedicated ECTAD country team in Egypt. This team will assist the national authorities in identifying country needs and implement activities at local and national level. A proposal to support epidemiological surveillance and improvement of biosecurity production systems at district and governorate levels is under discussion with the national authorities. The proposed approach would enable the establishment of local disease management systems in the five most affected governorates in the Delta region.

Jordan

ECTAD has assisted the national authorities in preparing a draft contingency plan through an international consultancy. An international laboratory expert was fielded for two weeks mission to assess laboratory capacity for diagnosis of HPAI and provide on-the job training in laboratory techniques. ECTAD has also supplied equipment and reagents to the central laboratory, and provided communication and data processing equipment for surveillance campaigns. FAO resources enabled a national veterinary official to attend the FAO-OIE international conference on poultry vaccination in Verona, Italy, in March 2007.

Lebanon

Staff at the national veterinary laboratory were trained in HPAI testing, data entry and reporting protocol. Equipment and supplies were provided to the laboratory to upgrade its capacity to support disease surveillance work. Support was also provided for a poultry farm registration campaign and for coordination efforts to draft a national contingency plan. FAO resources enabled a national veterinary official to attend the FAO-OIE international conference on poultry vaccination in Verona, Italy, in March 2007. An international expert was fielded for one week to advise on laboratory procedures.

Syrian Arab Republic

Syria has benefited from the supply of equipment, including data processing equipment, disinfectants and laboratory reagents. A real-time PCR machine was procured to upgrade the capacity of the diagnostic laboratory. An international consultant recruited by ECTAD assisted national authorities with the drafting and assessment of a national contingency plan. A national consultant was engaged to conduct a desk-top study of the poultry sector. Support was also provided for a surveillance campaign and for the establishment of a database on the poultry sector. An international laboratory expert was recruited to train national staff in diagnosis procedures and advise on additional equipment requirements. A training programme in surveillance and epidemiological investigations, biosecurity and other aspects of HPAI is under way for veterinary staff from all governorates.

The West Bank and Gaza Strip

An international veterinary consultant was recruited for a two-month mission (January-

February 2007) to support HPAI prevention and control activities and to assist in project implementation. Another consultant was recruited in June 2007 for a 35-day mission to assist with the start-up of two complementary projects, one funded under Sweden's contribution to SFERA and the other funded by the UNDP Administered Donor Joint Trust Fund. These two projects have a combined value of almost US$1 million. Three national consultants were recruited to assist with project activities. Laboratory equipment and supplies worth more than US$100 000 were provided to upgrade the veterinary laboratories in both the West Bank and the Gaza Strip. FAO resources enabled a national veterinary official to attend the FAO-OIE international conference on poultry vaccination in Verona, Italy, in March 2007. A letter of agreement signed by FAO and the Kimron Veterinary Institute in Israel has enabled the training of officials from the West Bank and Gaza Strip in laboratory techniques and sampling. Advice has been provided on compensation policy and the operational plan, working in collaboration with UNDP and the World Bank. A surveillance programme is ongoing until June 2008 with full support from FAO. An international consultant was recruited for to weeks to advise on biosecurity and provide local training as appropriate. A series of training and study tours abroad in epidemiology and laboratory diagnosis of HPAI are planned for November-December 2007. Fifteen veterinarians will benefit from this training.

Yemen

Equipment and supplies were provided in order to upgrade the diagnostic laboratory. A training programme in surveillance and epidemiological investigations for more than 100 field veterinarians and veterinary technicians will continue until the end of 2007. FAO will provide financial support and the services of an international consultant to assist with the programme. FAO contributed to the development of the national strategic plan and provided training in laboratory procedures. A three-week training was organized abroad for two laboratory staff on HPAI diagnosis.

Central Asia

ECTAD is implementing a Central Asia regional network project to sustain activities to combat HPAI in nine countries in Central Asia: Afghanistan, Azerbaijan, Iran, Kazakhstan, Kyrgyzstan, Pakistan, Tajikistan, Turkmenistan and Uzbekistan. The anticipated total investment in the project is US$3 600 000 over three years.

The framework of the regional network project encompasses a common vision to prevent and control HPAI across the region and is consistent with the FAO/OIE Global Strategy. The project promotes regional and country-based activities to strengthen capacity building in animal disease surveillance, reference laboratory services, rapid response, coordination, early warning procedures and impact/risk assessments (including wildlife, socioeconomics and communication).

Until early 2006, activities had been supported by various sources of funding, including SFERA resources, the UN Assistance Mission in Afghanistan and FAO's TCP. FAO provided all countries of the region with an emergency kit of laboratory and veterinary equipment (each kit worth on average US$36 000). Afghanistan, Azerbaijan, Iran and Pakistan were provided with cash amounts of US$45 000 each in the form of budget disbursements to

local FAO offices, to enable an immediate response to outbreaks of HPAI and to support the organization of regional avian influenza workshops and other coordination and preparedness events.

An inception workshop for the regional network project was held from 30 October to 2 November 2006 in Tehran for the CVOs or delegated government officers of beneficiary countries. The aim was to discuss all issue related to HPAI control in animals, with the specific purpose of enabling country delegates to identify their specific needs and point out where support from the regional network project would be most needed. The beneficiary countries developed and adopted a work plan for the project. The work plan recommended project activities to be carried out, emphasizing the need for basic laboratory training and surveillance activities.

Laboratory training took place from 18 to 22 December 2006 in Dushanbe in Tajikistan to improve the basic diagnostic capacity (rapid virology tests/serology) of key technical staff of selected countries. In particular, the training workshop sought to transfer to participants experience and knowledge in the diagnosis and control of avian influenza, and to distribute documents and training materials on clinical diagnosis and laboratory tests for avian influenza. Two technicians from Afghanistan, Azerbaijan and Uzbekistan, along with 11 technicians from Tajikistan, attended the training. The trainers were two virologist experts from IZSV. Simultaneously, basic kits of laboratory supplies were procured and shipped to Afghanistan, Azerbaijan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan. The kits, worth about US$5 000 each, arrived in all countries between the end of December 2006 and the end of January 2007.

A regional coordinator for the regional network project, based in FAO's country office in Tehran, Iran, was appointed and began his assignment on 1 August 2006. A second expert started his assignment in October 2006 and is based in Baku to work more specifically on Azerbaijan and other countries in the Caucasus region.

In the first half of 2007, several identification and needs assessment missions were conducted in Afghanistan, Iran, Kyrgyzstan, Pakistan, Turkmenistan and Uzbekistan. Joint appraisal missions to Turkmenistan and Uzbekistan were conducted in February 2007 and June 2007 to assist the World Bank in developing these countries' avian influenza control and human pandemic preparedness and response project grants.

Following outbreaks of HPAI in Afghanistan in February 2007, a CMC/AH mission visited Afghanistan from 11 to 25 March 2007 to reinforce the avian influenza country team in its response capacity-building work.

A regional surveillance workshop was held in Ankara from 27 February to 7 March 2007 to discuss principles and methods of surveillance systems for avian influenza and to build a common vision on how to approach surveillance activities in different poultry production sectors and wildlife. The workshop aimed to develop a common methodology that in turn could be adopted within each participating country and facilitate the sharing of experiences and information. Two participants from each of the nine beneficiary countries attended the workshop. Two wildlife experts and one surveillance expert were contracted to provide training support and expertise during the workshop. A manual on surveillance and outbreaks investigations was delivered to the participants as well as a booklet on wildlife surveillance guidelines in Russian and English.

Under the regional network project, Afghanistan and Azerbaijan are to receive the most support due to their history of outbreaks and weak response capacity.

COUNTRY HIGHLIGHTS

Afghanistan

The 'Interim Emergency Assistance for Avian Influenza in Afghanistan' project, launched with SFERA resources in early 2006 and bolstered with ADB funding, has strengthened the capacity of veterinary services to undertake surveillance activities and laboratory diagnosis by providing equipment and dispatching trained surveillance teams when needed.

The surveillance teams visited households, live bird markets, commercial and semi-commercial sector producers and wetlands. More than 4 500 samples have been collected and analysed by the surveillance teams and in the Kabul laboratory. An average of 500 samples was received monthly. From mid-February to mid-November 2006, 758 samples were taken and analysed in the Kabul laboratory, of which 26 were H5 positive (reported by FAO in March/April 2006). From June 2006 to the end of January 2007, 4 515 samples were taken from chickens (98 percent), ducks (0.60 percent) and turkeys (1.4 percent) by the surveillance teams around the wetlands and in the villages of the six provinces that were affected by the virus previously. All tested negative for H5, one was positive for H7 and 11 positive for H9N2.

FAO's activities and response to avian influenza outbreaks in Afghanistan are being further integrated and merged into the overall regional network project's specific objectives and expected outcomes.

In late February 2007, outbreaks of HPAI were reported in the provinces of Nangarhar and Kunar. Affected species included backyard poultry and turkeys. From 13 to 16 March 2007, outbreaks were also identified in Kabul province. All the suspected human cases of H5N1 in Afghanistan have to date tested negative.

During March 2007, in response to the outbreak, the regional coordinator, under the auspices of the FAO/OIE CMC/AH, provided training to customs/interior ministry officials, veterinarians and commercial poultry farmers on FAO's approach to preventing and controlling HPAI. Outbreak investigations and field visits were conducted, and guidance on epidemiological investigations was given to veterinarians based in areas affected by the outbreak.

FAO is currently developing a system to analyse trends based on the morbidity/mortality rates in the different provinces. The trends will also be analysed on the basis of serological investigations. The results should enable the development of an early warning system on avian influenza in Afghanistan.

Capacity building in Afghanistan continues under several programmes. The findings of projects funded by various donors, including the European Commission and USAID, are being shared with FAO through steering committees established by the Ministry of Agriculture, Irrigation and Livestock under the chairmanship of the Veterinary Department. A common understanding and approach is being developed.

Azerbaijan

Following suspected outbreaks of HPAI in December 2006, FAO facilitated sample shipments to an FAO/OIE reference laboratory.

In addition, technical advice was provided by the international consultant based in Baku through weekly meetings and roundtable discussions with national authorities. Training for field veterinarians in disease outbreak investigation, sample collection and submission was carried out during field investigation of suspected cases of avian influenza.

A national active surveillance programme for avian influenza in domestic poultry and an avian influenza disease monitoring programme in main wetlands were designed in collaboration with national veterinary officials. These programmes will focus on ten high-risk areas, including areas where the disease has already occurred in humans and animals and areas where domestic poultry and wild birds are in abundance. The capacity of the country for early response in case of the reintroduction of avian influenza was evaluated and, based on the identified gaps, an emergency mobile surveillance team project was developed.

A one-day training course and discussion was organized before the implementation of avian influenza disease surveillance and monitoring activities for up to 40 field veterinarians at the district level. Procedures, methods of surveillance of data collection and sampling were discussed.

To improve the capacity of veterinary district offices in high-risk areas for rapid reporting of disease outbreak information, sets of faxes, computers and printers were procured and delivered to each office. In addition, and in close collaboration with the private sector, a basic computer training course for district veterinary officers to improve their computer skills (especially e-mail use and Internet access) was conducted in March and April 2007.

Eastern Europe and the Caucasus

The region covers 17 countries: Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Georgia, Hungary, the Former Yugoslav Republic of Macedonia, Moldova, Montenegro, Romania, the Russian Federation, Serbia, Turkey and Ukraine. The core of FAO's contribution in these countries has been technical assistance, especially the training of local veterinary services in disease diagnosis and modern diagnostic techniques, epidemiological analysis of outbreak data and surveillance in poultry and wild birds, and promoting countries' participation in regional networks. Since there is a significant regional risk of reintroduction of the disease, regional networks and coordination are very important components of Global Programme activities in Eastern Europe and the Caucasus.

FAO has provided basic emergency equipment to upgrade existing laboratory facilities and to enhance preparedness and response capacity in Albania, Armenia, Azerbaijan, Bosnia and Herzegovina, Bulgaria, Croatia, Georgia, the Former Yugoslav Republic of Macedonia, Moldova, Montenegro, Romania, Serbia, Turkey and Ukraine. A number of workshops have been carried out in the region to strengthen regional networks. SFERA resources have helped a number of countries to participate in regional workshops, training sessions and meetings whenever other funds were not available.

SFERA funding supported the development, translation and publication of FAO avian influenza manuals and various technical documents and materials on avian influenza in

local languages. FAO has fielded three regional international consultants to conduct coordination and emergency activities in this region; in Azerbaijan (coordinating HPAI activities in the South Caucasus), in Hungary (coordinating activities in Eastern Europe including the Balkans) and in Turkey. In Turkey, FAO also hired a consultant to develop a longer-term strategy for the country's HPAI control, restocking and biosecurity plans. Other experts contributed to the development of a long-term strategy on socioeconomic-related aspects in Turkey and assisted Turkey's Ministry of Agriculture in bringing HPAI in the country under control within three months without widespread culling or vaccination. National consultants are currently working in Albania, Armenia, Bosnia and Herzegovina, Georgia, Kosovo, Macedonia and Serbia in support of HPAI activities in their respective countries.

Numerous emergency support missions and needs assessment missions have been deployed in the region. The expertise made available by FAO in this regard has included emergency preparedness and disease control specialists, veterinary diagnostics experts and socioeconomic/compensation strategists. FAO participated in a number of joint missions with the World Bank, WHO, OIE and others to Albania, Romania, Serbia and Ukraine to evaluate preparedness and response capacity with regard to HPAI. FAO also contributed technical expertise to a UN country team meeting in Moldova on emergency assistance and preparedness in the region.

A regional project to develop and conduct national desk-top simulation exercises to test country preparedness and reaction in the event of an HPAI outbreak is under way. Armenia hosted the first exercise, which involved veterinary and human health authorities.

Further to the regional assistance provided, national projects for emergency preparedness and control of avian influenza have been implemented in Romania and Macedonia. In Romania, activities focused on training of laboratory, ornithology and epidemiology experts, whereas Macedonia received assistance in the development of a preparedness strategy and training of laboratory experts in PCR diagnostic techniques, as well as development of public awareness campaigns.

ECTAD has developed a preparedness strategy and a detailed three-year work plan for this region in order to strengthen the capacities of countries to prevent and control HPAI outbreaks, thereby preventing serious losses to poultry raisers and rural economies, reducing the impact on food security and safeguarding human health and safety.

Latin America and the Caribbean

In May 2006, in an effort to stay ahead of the disease, FAO allocated US$2 million of its own resources and launched four sub-regional TCPs in Latin America and the Caribbean, where HPAI had not yet arrived, focusing on using the experiences from Asia and Africa to strengthen national and regional preparedness in case of an outbreak. Initial TCP workshops were conducted in each sub-region with the national coordinators, CVOs, representatives of regional and international agencies and national/regional poultry producers. The aim of the workshops was to identify gaps and establish a timetable for activities to assist the 33 beneficiary countries.

Additional funds from SFERA were mobilized to support the activities planned under sub-regional TCPS. This additional funding made it possible to increase the number of

participants from the beneficiary countries attending training workshops, as well as enable the procurement of equipment and supplies deemed essential for successful implementation of project activities.

These activities were executed in close collaboration with other international organizations including OIE, the International Regional Organization for Animal Health and Plant Protection (OIRSA), the Inter-American Institute for Cooperation on Agriculture (IICA), the Caribbean Community and Common Market (CARICOM), the Pan American Health Organization (PAHO), Andean Nations Community (CAN) and USDA.

The preparedness and emergency veterinary plans were reviewed and countries are now updating them following FAO's evaluation and recommendations. These plans were reviewed again in May and June 2007. The diagnostic system was found to be the main limitation for early detection; as a result, two technical training sessions were organized to cover epidemiology and sample collection from wild birds and backyard chickens (in English and Spanish). All normative diagnostic training materials were provided by the FAO/OIE reference laboratory for avian influenza diagnosis in the Americas (in Ames, Iowa), stressing the importance of harmonized diagnostic procedures and laboratory analysis materials supplied by USDA.

In addition, a molecular diagnostic training course was conducted for those countries (13) with facilities, equipment and personnel dedicated to these procedures. A letter of agreement was signed with Argentina's official research centre to establish a GIS network for epidemiological analysis and surveillance for HPAI in all involved countries. A handbook entitled 'Guide to the prevention and control of avian flu in small-scale poultry farming in Latin America and the Caribbean' was published in English, Spanish, French and Portuguese, and distributed to veterinary services and poultry farmers in the region, along with a companion 20-minute DVD in Spanish aimed at improving small farm biosecurity. A regional website on avian influenza issues was designed and is online. The website contains updated information about the activities undertaken under the auspices of the TCP regional projects as well as documents and news. The website is planned to be used as a communication platform among the national coordinators and the project staff . SFERA funds support the design, maintenance and regular update of this website. SFERA funds also enabled the purchase of 2 500 PPE kits, information materials and disinfectants, distributed among all the countries in the region according to their needs.

PART 4
Funding the Global Programme

CURRENT FUNDING STATUS

At the Beijing conference in January 2006, the FAO/OIE Global Programme called for a three-year (2006-2008) budget of US$494 million to tackle the disease at source in animals, mainly in Southeast Asia. However, as HPAI spread to Africa, Central Asia, the Middle East and Europe, affected countries and many countries at risk of infection but with limited veterinary capacity turned to FAO for technical expertise and support.

In March 2006, FAO upped the estimate of the amount needed for the global HPAI programme to US$882 million, excluding eventual funds necessary for compensation schemes. Within this overall funding estimate, FAO's share was set at US$308 million over the three-year period. As of mid-November 2007, total contributions to FAO's Global Programme amounted to US$187 million, of which FAO had contributed US$9.7 million through its Technical Cooperation Programme (TCP) projects. The funding gap up to the end of 2008, is US$ 121.4 million short of the original estimate (see Table 1) FAO was in the process of negotiating an additional US$26 million in 'pipeline' funding. However, it is likely that overall requirements will increase in parallel with an expected increase in requests for technical support in the control of new outbreaks and prevention of further outbreaks, particularly in Africa.

ALLOCATION OF GLOBAL PROGRAMME FUNDS

A broad summary description of how ECTAD has planned to allocate funds to Global Programme components and activities at global, regional and country level is presented in Table 2. These allocations are based on the estimated US$308 million costs of the entire three-year programme (2006-2008).

TABLE 1
Current funding shortfall for Global Programme

Totals	Total (US$)
Funds requested	308,506,363
Funds received	187,136,374
Funding GAP up to end of 2008*	121,369,989
Funds in pipeline	25,971,830

*At the time of preparation of the UN Consolidated Action Plan 2007, the funding gap was US$127 million.

TABLE 2
Planned allocations for Global Programme components and activities

Global Programme component/activity	Allocation (US$)
A) Global coordination and support	**40 000 000**
A.1 Support for global coordination (ECTAD HQ + TSS*)	8 500 000
A.2 Establishment of CMC/AH + GLEWS	25 500 000
A.3 OFFLU networks and global wildlife surveillance	6 000 000
B) Countries	**268 506 363**
B.1 Regional coordination	89 478 774
B1.1 Support for regional coordination + CMC/AH	37 750 998
B1.2 Communication and socioeconomics	15 727 777
B1.3 Epidemiology networks	35 999 999
B.2 Countries at risk	78 810 861
B.3 Newly-infected countries	21 591 720
B.4 Infected countries	76 125 000
B.5 Contingency	2 500 008
TOTAL	**308 506 363**

*Technical Support Services.

FUNDING MECHANISMS

FAO's Technical Cooperation Programme

FAO has allocated US$9.7 million of its own funds through 25 national and regional emergency projects under its Technical Cooperation Programme (TCP). These projects, developed for and implemented in Asia, Eastern Europe, the Middle East, Africa, and Latin America and the Caribbean, formed the core of FAO's first reaction to the HPAI crisis during the early phase before donor funding became available. This financial commitment was not only a reflection of the seriousness with which FAO viewed the HPAI crisis but also a signal to donors of the scale of investment required to combat and eradicate the threat of HPAI.

FAO's past experience of agricultural emergencies suggests that rapid and immediate intervention at the start of a crisis can make all the difference to containment and recovery. However, donors are often reluctant to commit funds until the scale of a particular emergency becomes clearer. And in the case of HPAI, the considerable media interest in the disease was usually slanted towards the potential effects on human health.

Donors

FAO's Global Programme receives financial support from the Asian Development Bank (ADB), Australia, Belgium, European Commission (EC), Canada, China, Common Fund for Humanitarian Assistance in Sudan, France, Germany, Greece, Ireland, Italy, Japan, Jordan, the Netherlands, New Zealand, Norway, OPEC Fund for International Development, Saudi Arabia, Spain, Sweden, Switzerland, United Kingdom, United Nations Assistance Pro-

TABLE 3
Global Programme funding (November 2007)

Donor	US$ million
United States of America	64.08
Sweden	16.95
Australia	13.87
Japan	12.84
United Kingdom	10.17
FAO	9.68
Canada	9.48
Germany	9.04
Asian Development Bank	7.99
France	6.74
UNDP-Administered Donor Joint Trust Fund (UN)	6.65
Norway	3.70
Switzerland	3.70
Belgium	2.47
European Commission	2.21
Spain, Kingdom of	1.50
World Bank	1.20
Saudi Arabia, Kingdom of	1.00
OPEC Fund for International Development	0.70
The Netherlands	0.63
China, Peoples' Republic of	0.50
New Zealand	0.34
UN Development Programme	0.33
Ireland	0.32
Common Fund for Humanitarian Action in Sudan	0.30
Italy	0.29
UN Development Group Office (DGO)	0.19
Greece	0.19
Jordan, Hashemite Kingdom of	0.05
UN Assistance Programme to Afghanistan	0.02

gramme to Afghanistan, United Nations Development Programme (UNDP), UNDP Administered Donor Joint Trust Fund, United Nations Development Group Office (UNDGO), United States of America and World Bank (see Table 3).

Donors frequently earmark funds for particular countries or regions according to their policy priorities and the nature of the emergency in question. Since the beginning of the programme, FAO has attracted 133 donor-funded projects (including those financed with its own funds) worth US$187 million. A further 13 donor-funded projects (for a value of US$26 million) are at various points of the funding 'pipeline'. The most substantial commit-

ment of funds of the Programme has been to assist countries in Asia and Africa, although a significant portion of funding has been allocated to global projects (i.e. projects that embrace countries in different regions of the world).

Special Fund for Emergency and Rehabilitation Activities

ECTAD can draw on a special FAO fund set up in April 2004 – the Special Fund for Emergency and Rehabilitation Activities (SFERA) – when it needs to enhance its capacity to react rapidly in emergency situations. SFERA has three separate elements: a *revolving fund* to support needs assessment, technical assistance coordination and early establishment of an emergency coordination unit; *working capital* to start project activities as soon as agreements have been signed with donors (with the money transferred back to SFERA on receipt of donor funds); and *programme funding* to support emergency operations related to specific crises, such as the Indian Ocean tsunami and the spread of HPAI.

The value added of SFERA for ECTAD's HPAI prevention and control activities, many of which require a rapid and often unplanned for launch, is that the SFERA funds are not tied to determined programmes or countries/regions; this means that they can be allocated in a timely fashion to meet the needs and priorities of the moment. The SFERA facility has played a pivotal role in shaping a strategic programmatic response that is more flexible and more efficient, and which serves as a guide for the technical and operational units in FAO and the governments of countries in which the Organization works.

As of November 2007, 10 donors had contributed US$40.1 million to SFERA for HPAI operations, representing almost 21 percent of FAO's total funding portfolio for HPAI activities (see Table 4).

SFERA money has been deployed in support of national (country-specific) activities and regional and global coordination activities, and has supported a wide range of operational and technical activities including the provision of laboratory supplies, veterinary equipment and other HPAI disease control essentials, recruitment of technical experts for country field

TABLE 4
Donor funding for SFERA (November 2007)

Donor	Amount (US$)
Sweden	16 594 537
United Kingdom	6 876 228
France	6 635 910
Switzerland	3 696 573
Norway	3 506 326
Saudi Arabia	1 000 000
OPEC Fund	700 000
China, People's Republic of	500 000
Greece	188 442
Jordan	50 000
TOTAL	40,108,016

missions, travel costs, organizing meetings and conferences, and supporting the FAO/OIE Crisis Management Centre/Animal Health.

PROJECT AND BUDGET MONITORING

Within ECTAD, a global coordination unit is responsible for the accounting, monitoring and reporting of all HPAI activities under each component of the *Global Programme*. The unit's responsibilities include the continuous updating of all programme and project data in a specially designed FAO application – the Field Programme Management Information System (FPMIS). A special emergency module within this application serves as a repository for all information related to a programme and individual projects within a programme, including information about donor contributions, beneficiary countries, financial commitments, project activities, field budget authorizations and reporting. In addition, the module permits accounting of all HPAI activities against each of the *Global Programme* components to ensure transparent and timely reporting to donors.

Conclusion

The spread of HPAI to Central Asia, Europe, the Middle East and Africa has increased the global threat posed by the disease. Member Nations infected with HPAI and at risk from the disease look to FAO for technical expertise and support. FAO has revised the Global Programme to take into account the changing circumstances, in particular in Africa and the extension of the Programme to Latin America and the Caribbean. FAO now estimates that US$882 million is required for HPAI activity in the animal health field, a figure which excludes compensation costs. FAO proposes to implement activities within a budget of US$308 million. These estimates are based on requests already received from FAO Member Countries and the likelihood that as the disease spreads, more countries will request assistance. FAO has received or has agreed with donors US$187 million, with an additional US$26 million in the pipeline.

FAO's vital role lies in providing rapid technical assistance and the necessary operational support to the governments of newly-affected countries. This encompasses all facets of disease prevention, response and assistance to all affected production systems and livelihoods – including emergency preparedness planning, control and surveillance activities, disease intelligence, diagnostic capacity, communication, socioeconomic issues, marketing and trade. The Organization has also supported networking and promoted a coordinated and harmonized technical approach to HPAI control. While emergency and short-term assistance is indispensable, FAO is committed to long-term assistance to secure the control and eradication of the disease and better preparedness for future zoonoses. In this regard, FAO has developed substantial thematic work in partnership with UN agencies and specialized institutes.

There has been significant progress in the implementation of the Global Programme. Enhanced surveillance is providing better understanding of the evolution of H5N1 viruses and the epidemiological control of HPAI. It has also enabled the detection of viruses against which current poultry vaccines do not provide full protection. Improved laboratory capacity in a number of countries is assisting surveillance programmes. The disease has been eliminated from a number of newly-infected countries, demonstrating the importance of increased preparedness and response capacity. International meetings and conferences have recognized that the diseases is not going to be eliminated in the short to medium term globally, that sustained control in places with entrenched infection depends on identifying and overcoming high-risk commercial production and marketing practices, and that wild birds are playing some role in the dissemination of these viruses, especially transboundary spread.

However, veterinary capacity and the structure of the poultry sector in developing countries still make surveillance difficult. The quality management of laboratories and epidemio-surveillance services require strengthening to cover both national systems and regional networks. There is need to continue to improve monitoring mechanisms of test

viruses that require sample submission to reference laboratories and to review existing vaccine licensing procedures in some countries. HPAI emergency preparedness plans must also be tested because HPAI will remain a global threat as long as infection persists in some countries. Additional funds are necessary to perform activities, increase human resources and strengthen the technical and operational capacity of ECTAD.

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