Assessment of likely impacts of avian influenza on rural poverty reduction in Asia: Responses, impacts and recommendations for IFAD strategy
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Acronyms

AI  avian influenza (avian flu)
APL  Adaptable Program Loan (World Bank)
AsDB  Asian Development Bank
ASEAN  Association of Southeast Asian Nations
AusAID  Australian Agency for International Development
AVSF  Agronomes & Vétérinaires sans frontières
BPM  Bangladesh poultry model
BRAC  Building Resources Across Communities
CGIAR  Consultative Group on International Agricultural Research
COSOP  country strategic opportunities programme
CPM  country programme manager
DANIDA  Danish International Development Assistance
DFID  Department for International Development (United Kingdom of Great Britain and Northern Ireland)
DLS  Department of Livestock Services (Government of the People’s Republic of Bangladesh)
ECTAD  Emergency Centre for Transboundary Animal Diseases (FAO)
EMPRES  Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases (FAO)
FAO  Food and Agriculture Organization of the United Nations
H5N1  an avian influenza virus
HPAI  highly pathogenic avian influenza
ILRI  International Livestock Research Institute (Nairobi)
MFTSP  Microfinance and Technical Support Project (IFAD)
NGO  non-governmental organization
OIE  World Organisation for Animal Health
P4K  P4K - Phase III (Pembinaan Peningkatan Pendapatan Petani Kecil - Phase III – Income-Generating Project for Marginal Farmers and Landless - Phase III, IFAD)
PPLPI  Pro-Poor Livestock Policy Initiative (FAO)
PRA  participatory rural appraisal
PRSP  poverty reduction strategy paper
SARS  severe acute respiratory syndrome
SLDP  Smallholder Livestock Development Project (IFAD/DANIDA)
UNDG  United Nations Development Group
UNDP  United Nations Development Programme
UNICEF  United Nations Children’s Fund
UNSIC  United Nations System Influenza Coordination
USAID  United States Agency for International Development
WFP  World Food Programme
WHO  World Health Organization
Foreword

IFAD’s experience shows that village or backyard poultry production is fundamentally important to the poor, and especially to rural women. For many poor households, poultry is primarily a form of savings, which can be used in building up assets or generating cash quickly by sale in time of need. Studies conducted in Bangladesh have shown that when appropriate support is provided, women poultry producers have been able to increase incomes, buy more food, send children to school and augment their assets.

Since the outbreak in December 2003, highly pathogenic avian influenza (or avian flu) has affected millions of birds in many Asian countries, particularly in the South-East Asian countries of Cambodia, Indonesia, Thailand and Viet Nam, as well as in China. More than 230 million poultry in affected countries have died or been slaughtered as of end 2006. Despite considerable control efforts, the avian flu virus continues to be detected, at least sporadically, in humans or birds in these countries. Poultry industries have been badly hit by both direct losses and a fall in prices due to the drop in consumer confidence. However, the most vulnerable groups are smallholders, many of whom are rural poor women with few assets and no animals other than poultry. Poor poultry raisers both contribute to the risks and are directly and indirectly vulnerable to avian flu under both animal and human health aspects.

The health dimension of the epidemic, particularly the increased risk of the virus mutating to become a potentially dangerous human-to-human pandemic virus, has received much attention internationally. However, there have been few studies of the impact of the disease on poor, small-scale poultry producers or of ways to build their capacity to mitigate this impact and prevent future outbreaks. The present study was designed to fill this gap. It has identified concrete measures to mitigate adverse impacts of future epidemics, reduce the vulnerability of poor poultry producers, rehabilitate affected producers and foster sustainable poultry-raising through enhanced biosecurity in the poultry sector.

We believe that the study findings and recommendations will be of interest to implementers of development projects focusing on smallholder poultry production – as well as to policy-makers, development practitioners and donors for the design of conducive policies and programmes in support of poor poultry producers.

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Introduction

Background
Since December 2003, over 56 countries have officially reported highly pathogenic avian influenza (HPAI) outbreaks to the World Organisation for Animal Health (OIE). Starting with the severe outbreaks in South-East Asia, avian influenza or flu (AI) has so far infected over 275 people, killing 167 of them. More than 230 million poultry in affected countries died or were slaughtered through 2006. Despite considerable control efforts, the AI virus (H5N1) continues to be detected, at least sporadically, in humans or birds in Cambodia, China, Indonesia, Thailand and Viet Nam. There have also been avian flu outbreaks in parts of South Asia, Russia and Central Asia, Turkey and Eastern Europe since 2005, and the Middle East, Western Europe and North and West Africa in 2006-2007.

With the virus becoming increasingly endemic and widespread, there are increased risks of it mutating to become a potentially very dangerous human-to-human virus, raising fears of global pandemic. With this additional possible threat, the urgent priority is to minimize the risks, as far as possible, at the source. This means that more-sophisticated and effective animal health control and prevention measures are urgently required, as well as stringent regulation of the poultry industry. However, addressing the problem at the source means directly or indirectly addressing the livelihoods of a large number of rural poor people in the affected countries and those at risk in Asia.

Many Asian countries at risk have rapidly expanding poultry industries, combined with large and dense human populations. With limited veterinary infrastructure, outbreaks of avian flu in some of the non-infected countries would cause devastating results, in particular affecting a very large number of rural households, the large majority of which keep at least a few poultry.

Poultry industries have been severely hit by both direct losses and a fall in prices due to the drop in consumer confidence. The most affected and vulnerable groups are smallholders, many of whom are rural poor women with few assets and no animals other than poultry. Poultry raisers may both contribute to the risks and be directly and indirectly vulnerable to avian flu under both animal and human health aspects – through the direct impacts of outbreaks and the resulting market effects, and through the implementation of more stringent control and prevention measures. Thus special attention should be paid to poor poultry farmers in the process of: AI prevention and control, compensation for culling, and support for rehabilitation and restocking. The overall strategy should be pro-poor, taking into account the real needs and interests of poor poultry farmers, who are those most vulnerable to avian flu.

Outbreaks and control measures may also have direct or indirect impacts on ongoing and future IFAD-supported projects, undermining the effectiveness of overall poverty reduction strategies. Avian flu poses both a challenge and an opportunity for IFAD. The Fund has been engaged in rural poverty and hunger reduction through loan programmes and technical assistance grants since its inception in 1977. It is not a

1 As of early March 2007.
technical agency, nor does it have the internal capacity to deal with crises. It has few resources in proportion to the considerable country, regional and global costs of addressing avian flu. Nevertheless, since the early 1980s, IFAD has also been involved in restructuring and rehabilitation programmes after natural disasters and is exploring a policy on crisis prevention and recovery.

One of the major challenges for IFAD will be the pursuit of poverty reduction strategies and policies that pay careful attention to risk and vulnerability reduction, mitigation and coping mechanisms. Typical examples are found in the context of HIV/AIDS, the severe acute respiratory syndrome (SARS) pandemic, the December 2004 tsunami and major earthquakes. The risk of an AI pandemic, which could destroy the livelihoods of large numbers of rural poor people and generate health risks for the world community, would be one of the most serious potential crises of the next decade. In tackling this large but highly uncertain risk, IFAD could contribute by addressing the needs and vulnerabilities of poor poultry producers in the face of AI outbreaks, as well as through control and prevention. IFAD has considerable experience in supporting the livelihood development of rural poor people – including livestock raisers, many of whom are women – and could contribute to possible mechanisms and policies for addressing avian flu at the grass-roots level, including the needs of vulnerable producers of small livestock.

Purpose of paper and outline

The purpose of this paper is, first, to assess those issues, impacts and responses to avian flu that are relevant to IFAD, particularly in terms of pro-poor policies and possible effects on its operations in Asia. Second, the paper will suggest what the priorities of IFAD might be in relation to the AI crisis, both in addressing immediate impacts on high-priority target groups and in contributing to mitigating medium-term impacts and preventing future outbreaks. This technical report will address the above issues through the following sections:

- Section I reviews the evolving situation of AI outbreaks in Asia, their effects and characteristics. Key epidemiological findings and some of the issues they raise for control and prevention strategies will be identified.
- Avian flu prevention and control measures being implemented by countries, as well as international responses, will be identified in section II to assist in identifying weaknesses, gaps and opportunities for support and collaboration.
- Section III looks in greater depth at some of the institutional and structural factors of the poultry sector in Asia, how they have affected the control of avian flu and what challenges they pose for long-term efforts to reduce AI risks and impacts.
- The ongoing and likely socio-economic impacts of AI outbreaks and control measures on poultry producers’ livelihoods are examined in section IV. Pro-poor aspects are of particular interest, that is, vulnerability of poor people to avian flu, both from ongoing impacts and future control and prevention measures.

2 The eighty-fifth session of the IFAD Executive Board (6-8 September 2005) discussed IFAD policy on crisis prevention and recovery (document EB 2005/85/R.4).
• Section V reviews the ongoing and likely impacts of avian flu on IFAD-supported projects and identifies some lessons learned through these projects that may be useful in addressing the crisis.
• Section VI presents regional objectives and strategies that IFAD may adopt and implement over the medium term (2007-2010) at country, regional and corporate levels in the Asia and the Pacific region. Both more immediate and longer-term actions are identified.
I. Avian flu outbreaks and the evolving situation

AI viruses have been recognized for well over one hundred years, and similar viruses were linked to major human flu pandemics after World War I and in the 1960s and 1970s. In the 1980s and 1990s, there have been extensive poultry AI outbreaks – for example in the United States and Pakistan – causing considerable economic losses from deaths or culling. Nevertheless, since the first outbreak report in 1959, only 21 relatively confined outbreaks of the H5 or H7 forms of the virus have occurred. Outbreaks of these forms also affected Italy in 1999 and the Netherlands in 2003.

In 1997 a highly pathogenic H5N1 avian flu virus caused serious disease and extensive death in poultry and killed six people in the Hong Kong Administrative Region of China, prompting the Government to slaughter the entire poultry population of some 1.5 million birds. Nevertheless, the extent, spread and wide-scale impact of the most recent waves of avian flu, which started in Asia in 2003 and have reached Europe and Africa, are unprecedented and have caught many by surprise.

Outbreaks 2003-2006
The first wave from 2003 to mid-2004: The unexpected
The first wave of the latest H5N1 outbreaks was officially reported in January 2004 in four countries – Cambodia, Indonesia, the Lao People’s Democratic Republic and Thailand – and in February in Viet Nam. There were outbreaks in these countries earlier, but proper diagnosis and decisions on official reporting took time. One example was Indonesia, where the first unofficial outbreak was noted in August 2003. Monitored outbreak data showed a pattern of increased outbreaks from September to December 2003, peaking in January 2004. Japan and North and South Korea were also affected at the end of 2003, but moved rapidly to cull infected poultry and stamp out the disease.

All the South-East Asian countries were poorly prepared for this first wave of outbreaks, and their poultry industries were heavily affected. Lack of proper diagnosis or recognition of what was happening and uncoordinated and inefficient control mechanisms delayed the needed rapid response. Lack of open communication and delays in reporting possible outbreaks contributed to the spread and worsening of the disease. The number of poultry lost through culling and deaths during this first major outbreak is estimated at over 125 million. Viet Nam lost 44 million poultry, or 17.5 per cent of its stock, and Thailand 29 million, or 14.5 per cent of its stock in this first wave (McLeod et al., 2005). Over 40 people died from the AI virus in Thailand and Viet Nam.

The extent of the disease is definitely underestimated. After the February 2004 winter season outbreaks peaked, largely due to active though delayed country responses. With increased public awareness and fear of the disease, demand and prices for poultry dropped dramatically in all countries, discouraging production and marketing. In Cambodia and the Lao People’s Democratic Republic, outbreaks seem to have been fairly limited on small and backyard farms.
The second wave from mid-2004 to mid-2005: A resurgence
Starting in July 2004, there was a resurgence of severe outbreaks in Indonesia, Thailand and Viet Nam. A few smaller outbreaks were reported in Malaysia and, again, in Cambodia, Korea and the Lao People’s Democratic Republic. In Thailand this wave peaked in September 2004. At this point, a very thorough surveillance programme was implemented, which assisted in pinpointing continuing infection from ducks and provided a basis for concerted culling. In Viet Nam and Indonesia, the main outbreaks were slightly later. In Viet Nam the outbreaks peaked towards the end of the cooler season, when the virus survives better in the open, and after the Vietnamese New Year, when there is an increase in poultry production and movement. Although there were more outbreaks in this wave, indications are that these outbreaks were controlled more rapidly and effectively than in the first wave. Greater awareness among the public, officials and extension agents of the nature of the disease and possible responses seems to have contributed to this effectiveness.

The third and ongoing wave from mid-2005: Becoming global and endemic in key countries
By the end of 2005 the picture had changed considerably, with outbreaks spreading to new continents and with ongoing, smaller outbreaks in several of the countries that had experienced the first two waves. During and after the summer of 2005, outbreaks had spread into Western China, Russia and Central Asia, and Eastern Europe. Total human deaths are now over 140 globally. Assessment of migratory wild bird routes (especially geese and ducks) indicates that the virus could be carried from East Asia during winter migratory seasons to South Asia, the Middle East and Europe, and from there to Africa. Further outbreaks have occurred in the Middle East, for example in Iraq and Turkey, with severe, ongoing outbreaks in Egypt, some in East and West Africa, Bangladesh, India, Nigeria and Pakistan, and in Western Europe – mainly from wild birds, but also through importation of poultry meat. Egypt, Iraq and Turkey have had cases of human deaths in 2006, with extensive poultry outbreaks. Reports of outbreaks from previously unaffected countries are occurring regularly, often in the autumn and winter months.

It is now generally accepted that avian flu has become endemic in many parts of Cambodia, Egypt, Indonesia, the Lao People’s Democratic Republic, Thailand, Viet Nam and possibly Nigeria, with recurring small outbreaks and even human deaths in some of these countries. A continuing danger of resurging AI outbreaks exists in smallholder farming systems, where the disease is the most difficult to control. There are also concerns that some genotypes of H5N1 strains might have adapted to backyard, indigenous terrestrial poultry in the same way they have to domestic ducks, thus sustaining the risk of further outbreaks and mutations.

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3 This could also reflect improved reporting.
4 The World Health Organization (WHO) includes the beginning of 2005 in the third wave.
5 Avian flu situation updates, website of the Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases (EMPRES), Food and Agriculture Organization of the United Nations (FAO) (see ‘Institutional websites’ in References).
6 At end 2005 and 2006, other human deaths were reported in Azerbaijan, China, Egypt, Iraq and Turkey.
The highly pathogenic H5N1 virus has now spread globally, bringing with it future prospects of an even more-widespread, well-established and potentially dangerous virus. There are further countries at risk in Asia, such as Nepal and the Philippines. These and countries in Africa and ultimately the Americas could potentially be affected by introduction of the virus through wild birds or other means. Many of these countries offer production and veterinary conditions similar to those in countries affected in the early waves.

**Epidemiological patterns of avian flu outbreaks**

In order to design control and prevention strategies, it is important to assess and understand the specific risks of outbreaks within the poultry sector. This means understanding the causes of outbreaks and discerning patterns in the nature and spread of outbreaks by area and country. This understanding is still tentative, complicated by several factors.

The main waves of avian flu in China, Indonesia, Thailand and Viet Nam, while spreading widely across these countries, had their greatest concentrations of outbreaks in more densely populated areas – in terms of both poultry and people. Human and poultry density are closely correlated, thus impacts and risks will tend to be concentrated in these populated areas as well. Densely populated agricultural lowlands are often not where the poorest people live – those having the highest incidence of poverty – but they often have among the highest densities of poor people (for example, the Red River and Mekong deltas of Viet Nam (Minot, Baulch and Epprecht, 2003). These areas and people will be at risk and vulnerable.

**Relationship to wild birds and ducks**

The relationship between poultry density and outbreaks is not straightforward, with ducks and wild birds clearly playing an important role in the spread and maintenance of the disease. Over the last two years, there have been various studies of the H5N1 virus evolution, as well as field evaluation of its spread during the 2003-2005 Asian outbreaks. Those for China, Thailand and Viet Nam have shown that domestic ducks have become an important reservoir host of the H5N1 virus (Morris and Jackson, 2005). The nature of farming systems in some countries – where domestic free-grazing ducks are moved in flocks over long distances from province to province to feed on harvested rice fields – plays a major role in the transmission and maintenance of the H5N1 virus. There are strong links between free-ranging duck systems and triple cropping of rice.

In Thailand an ‘X-ray survey’ surveillance programme helped pinpoint, with high probability, that outbreaks had their source in free-ranging duck breeding areas in central Thailand (Gilbert et al., 2006), and subsequent control measures have focused on these areas with considerable success. Recent studies in the Mekong Delta in Viet Nam indicate that close to 20 per cent of domestic ducks, even without disease symptoms, release significant quantities of the virus. In the case of China, scientific articles suggest that the current epidemic originated in domestic ducks in southern China, where the virus has been circulating at least since 1997 and possibly much longer (for example, *Science* (Webby and Webster, 2003), and *Nature*, 8 July 2004). Disease resistance among ducks there is high, and remains endemic in southern China. The pattern is similar for central China.
Epidemiological observations suggest that wild birds have played a major role in the transmission of H5N1 viruses to domestic poultry, as well as playing a significant role in the transmission from Asia to Central Asia and Europe along migratory highways via Siberia. FAO has played a key role in initiating research which shows strong spatial links between the risk of HPAI H5N1 outbreaks with free ranging duck systems and triple cropping of rice in South East Asia (Gilbert et al 2008). Such findings reinforce the need for approaches to tackle the disease which take into account the wider ecological and sectoral contexts (Slingenbergh et al 2004).

Relationship to production and marketing
It is important to appreciate how poultry marketing and production behavior contribute to outbreaks, especially in the backyard and smallholder subsectors. Production of backyard and scavenging chickens’ is generally considered to have low biosecurity against avian flu and other poultry diseases. They are significantly exposed to wild birds and have plenty of opportunity to mix among flocks and spread infected fomites (faeces, feathers, dust, etc.) within villages and to local markets. Further anecdotal evidence (e.g. Delquigny et al., 2004, in Viet Nam) indicates that nearly all small farms were struck by poultry deaths in villages in which there was little cooperative, basic biosecurity behavior. However, the study also observed that preventive action during outbreaks in other villages (confining chickens for several weeks and reducing farm contact) could reduce outbreak spread.

The diffusion of avian flu through poultry-sector supply and marketing chains is also important. A comprehensive joint FAO/WHO study of different types of poultry market chains in Viet Nam highlights the poor biosecurity practices and complex network of collection, transport, marketing and slaughter of rural, small-scale and backyard poultry production (Agrifood Consulting International, 2007). For example, ‘assemblers’ collecting poultry from individual farmers in several villages carry the virus in the poultry waste picked up by their motorbikes and also mix flocks in markets.

While these sources of risk are very important, the focus should not be exclusively on smallholders and backyard poultry raisers as the main source of large-scale AI outbreaks. In the Lao People’s Democratic Republic, which is surrounded by infected countries, outbreaks only occurred in the nation’s few factory farms. In Malaysia the mortality rate from H5N1 among village chickens was very low, indicating that the virus spread more slowly among small flocks (GRAIN, 2006). Detailed analysis in Thailand indicated the highest incidence of outbreaks in ducks and the lowest in native chickens, which are mainly produced by the backyard system. Outbreak incidence was less among native chickens than among broilers and layers, which are mainly produced in more commercial sectors. The low incidence in native chickens was in part ascribed to the greater difficulty of reporting, but could also be due to remoteness and thus to the lower contact levels in more distant rural provinces.

GRAIN (2006) points out that long-distance transport of vaccines and poultry products such as chicks by the more industrialized poultry sector may contribute greatly to AI spread. The diffusion of industrial poultry production and trade networks has created ideal conditions for the emergence and transmission of lethal viruses such as the H5N1 strain of avian flu. Once inside densely populated factory farms, viruses

7 These are allowed to roam freely outside family compounds, largely feeding on found scraps and seeds.
can rapidly become lethal and multiply. The FAO Pro-Poor Livestock Policy Initiative (PPLPI) is examining in detail some of the evidence that smallholders may in fact pose lower risks compared with large-scale producers (FAO, 2007).

Commercial and industrial poultry farmers, who are generally thought to have strict hygiene codes and veterinary services, have suppliers and traders that travel considerable distances with large volumes of poultry – and just small lapses in hygiene practices can produce long-distance spread. The mix of sectors and interactions in marketing systems may be more critical. Illegal, long-distance commercial trade across borders has been identified anecdotally as contributing to the first wave of introduction and outbreaks, for example from Malaysia to Sumatra. Such evidence is also supported by commonalities in virus types among countries in South-East Asia (Morris and Jackson, 2005). Considerable further analysis is needed to better understand patterns and risks among and between the different poultry sectors – and how this should be reflected in policies and direct support. Many of the larger companies in all countries are owned or controlled by politically influential people. This poses potential challenges in terms of supporting the interests of smallholder and backyard poultry raisers.

Towards an initial risk assessment

The above analysis of epidemiology and geographical risk suggests that at least an initial attempt should be made to identify areas of greater risk within countries. This will enable IFAD to collaborate with partners in assessing risks for ongoing and future projects. Some maps are provided in Figure 1 for the countries affected by the first wave of outbreaks; they identify geographical areas of greater risk, in terms of both source and potential impact.

Areas are defined by overlap of high poultry and human densities, wetland rice areas and records of infected ducks. Areas in which there has been illegal transport of poultry during outbreaks are also noted. The Red River and Mekong deltas of Viet Nam and central areas of Thailand are particularly associated with high poultry density and free-grazing ducks. The more coastal areas of provinces in southern China are known to be important initial sources of the H5N1 virus, and the wetlands of central China are a potential source of risk. Indonesia, western Java and southern Sumatra have very dense human and poultry populations, a mix of commercial and backyard farming, and scattered free-range duck production areas. Strategies will need to be closely adapted to specific country circumstances, while at the same time encouraging – with some urgency – the sharing of information and lessons among countries.
II. Control and prevention measures for avian flu

FAO and OIE have prepared a global AI strategy, in collaboration with WHO. The long-term objective is to minimize the global threat to humans and domestic poultry from terrestrial domestic poultry in Asia through progressive control of avian flu, particularly the variety caused by the H5N1 virus. The virus must be contained at the source, while at the same time preparing for the possible emergence of a variant that could be transmitted among humans. Achieving this goal will diminish the global threat of a human pandemic, stabilize poultry production, support a robust regional and international trade in poultry and poultry products, and increase human and food safety. However, the safeguarding of the livelihoods of rural poor people needs to be considered in this process.

An important focus of implementation of the global strategy is to build regional and country capacities for control and prevention. In terms of animal health, FAO, OIE and WHO recommend the adoption of national strategies having country-specific disease control plans consistent with the global strategy (FAO and OIE, 2005). While recognizing that complete eradication of the virus in Asia may not be possible in the short-term – owing to its presence in wild birds, ducks and the extensive backyard subsector – country-based disease control strategies will be based broadly on the following options. In the short term: surveillance, stamping out, control of movement and marketing, biosecurity with disinfection on farms and mass vaccination. In the longer term, it will be necessary to take broader measures to isolate areas with outbreaks or at risk and to prevent the recurrence of outbreaks. These can include: improved farm hygiene, control of live bird markets and slaughter, more-strategic vaccination, separation of poultry areas and strengthening of veterinary and extension services.

Ongoing and short-term country measures

Viet Nam

Viet Nam is one of the more severely affected countries. After official announcement of outbreaks in February 2004, authorities vigorously implemented stamping out and movement control, though with some variation between provinces. Despite these efforts there have been recurring outbreaks, and the country has decided to proceed with vaccination to control the disease. In September-November 2005, Viet Nam pilot-tested and implemented a full mass-vaccination programme with support from China and FAO. Lessons were well learned early on, and the mass campaign covered a large number of key provinces. Close to 250 million doses of vaccine were administered with a very high coverage, including of backyard poultry. Initial reports indicate that the campaign seems to have been largely effective, with no major outbreaks since November 2005, except in a few areas where no vaccinations took place. There have been follow-up campaigns, which have largely kept major outbreaks at bay, though there have been a few human deaths, indicating some persistence of viral circulation.

8 Vincent Martin, EMPRES, Animal Health Service (AGAH), FAO (pers. comm.).
The Government of Viet Nam (2006) has prepared an advanced national strategy that covers human health aspects as well, and which needs to be supported by a detailed disease control programme. Viet Nam is, to date, the only country in the region that has designed and is fully implementing an AI emergency recovery project, upgrading laboratory and diagnostic capacity, developing capacity-building for surveillance and improving the biosecurity of breeding farms. A larger follow-up project has been prepared with the support of a range of international agencies.

Viet Nam has also prepared a draft strategy for a national contingency plan, with recommendations for compensation policy and emergency preparedness, and is in the process of strengthening its veterinary services system. It has made several decisions on restructuring the slaughter and marketing of poultry near cities, with quarantine and certification necessary for the transport and sale of poultry. These decisions have taken effect and are influencing market chains in peri-urban areas (see section IV on impacts). Moreover, there have been government department proposals for a longer-term plan to restructure the poultry industry, moving poultry producers to less populated provinces, further centralizing breeding and production support, reducing the number of backyard and smallholder units from 8 million to 5 million by 2015, and supporting a high-biosecurity commercial, integrated poultry industry.

Indonesia
Indonesia, which has experienced widespread H5N1 infection since 2004, is now reporting the most human deaths and illness from avian flu. The disease has been found in nearly all Indonesian provinces. The smallholder farming system, typified by 30 million widely spread backyard and smallholder farms, has made it difficult to apply effective culling and other biosecurity measures such as movement control. The country has adopted a strategy of wide-scale vaccination in the predominantly commercial and backyard poultry sectors, with variable success in reducing the incidence of the disease. Some of the limitations of the vaccine strategy have been due to low-quality vaccines and the logistical difficulties of reaching a large number of small-scale farmers.

Broader circumstances have also contributed to the difficulties of implementing control measures in Indonesia. The unfortunate impact of the December 2004 tsunami forced the country to divert its focus to this immediate human disaster. In addition, decentralization of Indonesia’s district and subdistrict levels fragmented the national-provincial flow of disease information, control programmes and veterinary extension systems. This institutional constraint severely hampered effective, rapid alerts and stamping out responses during the first wave of outbreaks. The National Strategic Working Plan was only laid out in December 2005, despite FAO support in 2004. The country still has a considerable way to go in building an effective national disease-control strategy and programme. After a slow start, donors are beginning to provide concerted resources to support the Government.

A massive intervention is needed to reduce widespread circulation of the disease, especially in densely populated Java (and with an intense production density), where human fatalities and clinical cases have occurred. The scope of the problem in the vast smallholder poultry sector of this large country requires a medium-to-long-term
strategy for progressively controlling the disease. With FAO technical support for building up participatory disease surveillance and responses together with affected communities, there has been a vast increase in the identification of disease areas, but much more work on effective control measures is needed. The Netherlands and the United States have also contributed considerable support to surveillance and capacity-building. This endeavour requires continuing vaccination, stricter biosecurity and stamping out in order to progressively confine the disease to defined foci in Java and to establish disease-free compartments and zones. More-concerted political effort is needed towards effective coordination and implementation of control and prevention instruments. Measures such as the banning of backyard poultry-raising in Jakarta, which have been implemented recently, are unlikely to provide – strategically or socially – the best medium-to-long-term solutions.

China
China has a large share of the world’s poultry and the majority of its ducks, and generally has responded effectively and rapidly to outbreaks. It is a well-established developer and producer of vaccines against avian flu, which it used early in the outbreaks, and has had mass campaigns with over 2.5 billion poultry vaccinated, or 19 per cent. The Government has adopted an improved policy to compensate households whose animals are forced to be culled within the infected area, at market rates, with the cost shared by central and local governments. It has also implemented a mass-awareness campaign and hotlines, which, according to Chinese sources, has contributed to public collaboration. While the central and provincial governments have certainly acted vigorously, it is difficult to evaluate the overall degree of effectiveness of responses at the local level.

Despite the taking of active measures, AI outbreaks and human deaths continue to occur in China. Many new cases were reported in November 2005 and others since then. Information flows among the different levels and from the central Government were cause for concern during the SARS outbreak. While considerable progress has been made on this front, easily accessible information on what must be an endemic situation is not available. Considering that H5N1 emerged in China in 1997 and must be endemic there, smaller outbreaks must presumably have taken and be taking place, or are being spread by ducks without adequate monitoring.

Given the scale of the country, the enormous poultry industry (close to half the world's poultry), the large number of producers, many levels of administration and intensity of trade within the country, it is natural that the problem would be difficult to control fully in the medium to long term. In addition, if the virus has one of its key sources and is endemic in southern China – with a huge duck and pig production in close conjunction with chicken production – then longer-term strategies and measures are absolutely necessary to address risks in the poultry industry and of a pandemic. The nature of such strategies are yet to be clarified, nor have their consequences and potential negative trade-offs for rural poor people been publicly examined.

Thailand
Thailand has the second largest number of human fatalities from avian flu. Thus strengthening human public health and awareness ranks high on Thailand’s control agenda. The country has made great strides in managing the disease through
continuous improvement in its infrastructure, diagnostics and surveillance capacity, and has also provided regional support to other, poorer countries in the region. Its initiation of regular X-ray surveys (see section I, subsection “Epidemiological patterns”) helped pinpoint sources of outbreaks in ducks and thus rationalized and sped up its control measures. Thailand has an advanced country strategy document and disease control plans. It has avoided adopting vaccination as part of its control strategy, reasoning that effective, rapid culling and stamping out lower overall risks. Although Thailand has not requested any financial support, it is an active member of regional and international cooperation on AI control.

Cambodia and the Lao People’s Democratic Republic
Compared with other affected countries in the region, Cambodia and the Lao People’s Democratic Republic had relatively few outbreaks in the first wave. Nevertheless, Cambodia has had four human cases of avian flu in the latest wave (2005), indicating continuing close contact between diseased poultry and people and sustained longer-term risks. Even though AI incidence in both countries seems to be generally low and their poultry sectors largely subsistence-based, control of avian flu is important in the overall regional strategy. Both countries have severe financial and capacity constraints in dealing with animal diseases. Both are mountainous, with relatively low population and poultry densities, and with smaller-scale commercial production around the main cities only. Services to poor people are especially limited, though there are ongoing donor and NGO projects to strengthen community veterinary services and to maintain basic surveillance activities.

Other Asian countries
India, Pakistan and countries that border on affected countries – such as most of Bangladesh, Myanmar and lowland Nepal – have been affected with outbreaks and can be considered at risk. They have considerable areas of high-density, mixed small-scale and commercial poultry production and are in the migration paths of wild birds from affected areas. They also have high densities of poor people living in areas at risk. Their preparedness is limited in terms of action plans, resources and stockpiling of protective and control equipment and vaccines, and coordination between human and animal health systems, although programmes and projects are being established. There has been little consideration of long-term strategies for the poultry-sector structure in any of these countries. This leaves a large number of poor producers vulnerable to further outbreaks and uncertain as to future support.

Response of the international community
The economic impact and seriousness of the threat of a human pandemic have produced a strong international response to the crisis. This has focused principally on the emergency issues of addressing outbreaks and minimizing the risk of adaptation of the virus to a form that can transmit from humans to humans. International agencies with mandates for animal and human health have led the way, in the face of enormous challenges owing to the unpredictable nature and scale of the issue. FAO and OIE have prepared a common strategic plan for the control of the AI virus in animals. As indicated earlier, the technical agencies have been coalescing around a shared multisectoral strategy of treating the disease at the source, preventing/mitigating
the effects of an outbreak in humans and averting a human pandemic at country, global and regional levels. This emerging consensus around a global strategy was deepened at the United States-hosted Partners’ Meeting and at the Canadian Health Ministers’ Meeting in October 2005. An FAO/OIE/WHO/World Bank-sponsored meeting in Geneva, in November 2005, strongly endorsed the global strategy and the need to finalize costing of integrated country plans, regional and global requirements to support them, and a coordination framework.

Considerable funding commitments were made at the International Pledging Conference on Avian and Human Influenza in Beijing in January 2006, with the European Union, Japan, the United States, the World Bank and the Asian Development Bank (AsDB) pledging large resources through grants (US$1 billion) and loans (US$0.9 billion) (Beijing Declaration, 2006). The December 2006 Bamako conference highlighted the relative success of the follow-up on these commitments (US$582 million) and spending (US$199 million). This includes US$75 million being channelled through the multidonor Animal and Human Influenza Trust Fund Facility, managed by the World Bank. A very large part of this amount has been in the form of grants, with longer-term lending lagging behind. This reflects a wider view that dealing with avian flu is, to a great degree, a global public good.

FAO and OIE

FAO, in collaboration with OIE, leads implementation of the global strategic plan for control of avian flu: global animal disease status and reporting, animal diseases control methods, related animal health governance and policy issues, and capacity-building of national veterinary services. FAO has recently established the Emergency Centre for Transboundary Animal Diseases (ECTAD) to ensure a central chain of command for strategies for and implementation of the prevention and control of diseases such as avian flu. At the regional level, through FAO/OIE regional quality centres, FAO is in charge of technical support to operations, including regional organizations and efforts, for example in Central Asia. FAO has developed several technical cooperation programmes for AI, with the following activities: strengthening subregional networks; training in diagnostic and surveillance strategies; investigation of AI status of domestic and wildlife species; and avian wildlife/poultry interactions, as well as socio-economic case studies. At the national level, FAO has helped prepare several national strategies for avian flu, coordinated technical assistance and taken the lead as technical agency for AI issues in the Asia region.

FAO, OIE and WHO, in collaboration with United Nations System Influenza Coordination (UNSIC) and the United Nations Children’s Fund (UNICEF), organized a high-level Technical Meeting on Highly Pathogenic Avian Influenza and Human H5N1 in June 2007 in Rome, bringing together technical specialists from governments, United Nations agencies, donors and the private sector. The meeting provided a platform for assessing achievements and highlighting the broad sectoral and long-term strategies needed.

11 4th International Conference on Avian Influenza, Bamako, Mali, 6-8 December 2006. See World Bank feature story, Bamako meeting keeps focus on avian influenza threat, available at http://go.worldbank.org/CDOTMOXFZ0..  
12 FAO Technical Cooperation Project “Controlling Transboundary Animal Diseases in Central Asian Countries,” GTFS/INT/907/ITA.  
13 For good overviews of FAO’s work in the field with government agencies and partners, see FAO (2006a and b).  
World Organization for Animal Health

Since the beginning of the AI crisis, OIE has: (i) updated international standards and surveillance guidelines for the safety of international trade in poultry and poultry products; (ii) created a worldwide network of international expertise in partnership with FAO (OIE/FAO Network of Expertise on Avian Influenza); (iii) developed a proposal for the worldwide governance of veterinary policies; (iv) organized an international conference on AI control methods in April 2005; and (v) organized regional capacity-building through the five OIE regional representations, in partnership with FAO and WHO. It will be important to ensure that these standards and policies take into account the needs of poorer countries and producers.

World Bank

The World Bank provided the first integrated investment support to a government AI programme in Viet Nam. The Viet Nam Avian Influenza Emergency and Recovery Project, approved in August 2004, is supported through a World Bank emergency loan (US$5.0 million) and a Japan Social Development Fund grant (US$1.9 million), with FAO technical support, in particular for critical studies. While comprehensive, the project offers relatively little direct support to small-scale poultry farmers – mainly for surveillance – and a key component for restocking smallholders was suspended for a considerable period due to new regulations. A second phase US$35 million project is in preparation.

As part of the overall global financing framework for avian flu control, the World Bank has established a multi-country Adaptable Program Loan (APL) – with a total allocation of US$500 million (World Bank, 2005b) – as the vehicle through which to implement its Global Program on Avian Influenza. The APL is not allocated overall by country, but according to proposals submitted by countries. Funds are released through project application and processing. Loans and credits under the APL will be processed as emergency investment operations, using the procedures for regular country programmes. Programme components are modular and country-specific, and release of funds is based on the needs at the time. Regarding possible activities to address the animal health concerns of small-scale producers, country funding can cover surveillance and diagnosis of animals, strengthening of control programmes and outbreak containment plans, including vaccination campaigns. Support to low-income groups can be provided, for example awareness-building among small-scale farmers and improved animal health services at the community level.

World Bank projects related to avian flu have been approved in the Kyrgyz Republic, Nepal, Nigeria and some 10 other countries, and preparations are underway in a number of other countries in Africa, Asia and Europe.15 In practice, many of the projects have had a considerable grant contribution from the multidonor Avian and Human Influenza Facility trust funds,16 while loan commitments have been slower to disburse. Projects approved have generally allocated some start-up funds for compensation to some countries, and little, if any, to longer-term rehabilitation or structural aspects.

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15 For updates see www.worldbank.org/avianflu, go to “Projects”.
16 Full documentation is available at www.worldbank.org/avianflu, go to “Trust Fund Facility”.
Asian Development Bank
As of mid-2006, AsDB did not have major activities in the animal health and livestock sectors. Beginning in 2004, through the Association of Southeast Asian Nations (ASEAN), it implemented a US$1.0 million regional project on Transboundary Animal Disease Control in the greater Mekong subregion. As it has been mainly involved in the human health aspects of avian flu, AsDB is now assessing the need to increase its support of animal health aspects as part of its overall funding. In November 2005, it indicated that it could commit US$470 million to support Asia’s readiness and responses to fight avian flu, in close coordination with ASEAN, FAO and WHO.

Others
In September 2005, the United Nations Secretary-General appointed an overall coordinator of UNSIC, under the United Nations Development Group (UNDG). UNDG (2006) has outlined a strategic approach to coordinated United Nations involvement that builds on the FAO, WHO and OIE strategies (OIE has United Nations observer status). The United Nations Development Programme (UNDP) has assisted in setting in-country donor coordinating mechanisms and it oversees a multidonor trust fund for avian flu in Viet Nam. For socio-economic aspects, joint activities are being developed by FAO, UNDP and the World Food Programme (WFP) to assess food security and avian flu in Egypt. UNICEF is spearheading communication strategies and is examining perceptions and building awareness among smallholders in several countries.

The European Commission has established a task force to address avian flu. Directorates within the Commission have been given responsibility for coordination with European Union countries and with other regions. The Commission is contributing to the multidonor trust fund coordinated by the World Bank and is interested mainly in Eastern Europe and neighbouring regions. Several bilateral donors have provided emergency resources such as safety equipment, training and diagnostic support of the technical aspects of animal health control. The European Commission, Japan and the United States have been the largest contributors overall in terms of commitment and disbursements (US$564 million, out of US$722 million as of end 2006.)

Focus of efforts
The recently pledged commitments to combat avian flu are considerable. Significant resources will be directly addressing the needs of backyard and smallholder producers and the institutional mechanisms to support them. However, they are short of what is needed overall to confront the global problem: the complexities of the technical and operational preparedness needed to control the disease and the realization of institutional and sector changes in an increasing number of poor countries. This is despite the fact that these issues are beginning to be recognized at many levels as being of fundamental importance to long-term management of this and similar emerging diseases (Otte et al 2004).

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17 AsDB’s avian flu site is available at www.adb.org/BirdFlu/adb.asp.
III. Factors affecting the efficiency and future effectiveness of control and prevention measures

In addition to the basic technical and capacity issues of dealing with an animal health emergency, such as surveillance and control, the previous sections have indicated that there are some deeper institutional and structural obstacles and factors as well. These will need to be addressed in any longer-term strategies. Although some of the affected countries have taken firmer action, countries at risk remain unprepared, especially the poorer ones. In several of the countries affected initially, H5N1 has become endemic, which means that longer-term actions will be needed to control the disease. Several institutional and related structural factors underlie, at least in part, the severity of outbreaks and the challenges for long-term control. On the one hand, there are institutional challenges: poor veterinary services, decentralized agencies and inadequate coordination and resource allocation. On the other, structural factors in the dynamics of the poultry sector and the responses and needs of direct stakeholders such as producers and traders have also contributed to the spread and maintenance of avian flu. These issues have to be taken into account. Otherwise, there is a strong likelihood that any control and prevention measures will remain ineffective or will not be implemented at all.

Institutional challenges
The central veterinary capacity available to deal with avian flu is far short of what is needed generally, and most often does not reach out to large numbers of susceptible, small-scale poultry raisers. There is a shortage of trained professional staff in all the poorer AI countries (Rushton et al., 2005), which has affected surveillance and diagnosis, reporting, and stamping out, biosecurity and vaccination efforts.

Weak surveillance and diagnosis
Surveillance rarely takes place on a regular basis and has been inadequate during outbreaks, especially in smallholder and backyard poultry-raising. Better-off countries – within more integrated industries – are better prepared to address surveillance, but even they can be reluctant to invest until there is a large outbreak. There has been extensive non-reporting of disease by commercial companies as well as by small-scale poultry raisers, due to fear of adverse consequences for the farmer, the community, and local and export trade. Effective surveillance of a large backyard subsector is difficult. In addition, high tolerance of mortality (Newcastle and gumboro (infectious bursal) diseases and duck plague) means that small-scale farmers rarely report disease.
Difficulties in effective implementation of control measures

Speed and outreach are critical to the effectiveness of conventional control and prevention measures: culling with compensation, consistent vaccination with high-quality vaccines and good coverage, movement control, etc. The informing and the awareness of farmers, the public and authorities at all levels of the nature and consequences of and responses to avian flu are central to rapid, successful control and prevention of the disease. These measures – preventing the spread of virus from infected premises (biocontainment) and the exclusion of infectious agents from uninfected premises (bioexclusion) – have been very difficult to practise in several countries in the affected regions.

Decentralization of veterinary and extension systems

Decentralization of veterinary and extension systems has also largely influenced the effectiveness of veterinary capacity. Despite the potential of decentralization for more demand-led services, it has weakened coordination between departments and ministries and with the large-scale private sector. Perhaps more critically, it has often severely weakened extension to widely spread, small-scale producers, and left local resources for reporting, control, compensation and coordination inadequate to deal with a national emergency. Multiple layers exist in animal health systems – up to seven between farmers and central veterinary systems. Filtering of information occurs between these layers, partly due to reluctance and partly to lack of incentives or awareness of what to report. Efficient and effective ‘de-layering’ of veterinary services only becomes possible with a high level of commercialization.

Countries such as Indonesia, Viet Nam and to some degree China have considerably decentralized animal health systems. Provincial and district (or county) veterinarians come directly under local government authority in terms of planning, direct support and resources. Thus the central veterinary authority does not have direct line control over provincial veterinary authorities on important animal health concerns, but must negotiate with them. In addition, provincial-level services often tend to concentrate on the commercial sector, leaving lower layers to more informal or mostly poorly trained community veterinarians, where they exist. Decentralization affects resource generation for compensation and control as well – probably one of the most important constraints in countries such as Indonesia and Viet Nam (Rivière Cinnamond, 2005).

Poor coordination with other departments and the private sector

Poor coordination and communication between departments, typically human and animal health departments, is also a consistent problem in affected and at-risk countries. For example, there would be considerable mutual benefit in coordinated animal and human influenza surveillance. The poultry sector is also largely private-sector driven, adding another layer of complexity to coordination and rapid action. When livestock companies become very large, commercial interests take over from national interests. Company power to influence policy and collaborate with government is considerable (GRAIN, 2006). At the other end of the scale, there is generally very little structured support and few programmes for smallholders and backyard producers.
Few appropriate long-term policies and regulations

Appropriate country-level strategies, policies and regulations are generally at the early stages of development in most affected countries. Programmes must be specifically tailored to individual countries, taking into account: levels of infection when the disease is first detected (the importance of early diagnosis); structure of the industry; capacity of the veterinary authorities; goals of the surveillance programme; and the likelihood of successful implementation of the proposed measures or surveillance plans. Policies and programmes designed for developed countries such as Australia or western Europe need considerable adaptation to the sector and institutional conditions of typical IFAD target group countries.

There has been little disease-control planning based on socio-economic impact assessment, though with FAO support, there have been initial discussions at regional workshops on how to proceed (FAO, 2004). Sound economic impact assessments of AI control measures are essential in determining national economic and social intervention priorities, as well as the cost/benefit of implementing control programmes. Such assessments should consider trade issues, poverty reduction targets, veterinary and livestock development programmes, and socio-economic impact and economic policies – and should have a pro-poor orientation. Such concerted analysis is presently lacking in most countries, and the targeting of disease-control programmes through well-developed policy frameworks remains in its infancy. Considering the deeply transboundary nature of the AI problem, there has been remarkably little regional coordination to address long-term policy and socio-economic issues.

Challenges arising from subsector responses and needs

Since the beginning of the AI outbreaks, the roles of backyard and smallholder poultry-raisers have been noted in terms of both their contributions to avian flu risk (see section I, subsection “Epidemiological patterns”) and the social and economic burdens on them from outbreaks and control measures. Economic and social factors, in general, have been identified as important, but have been more difficult to analyse and address.

Backyard and small-scale poultry production, market practices and rural poor people

As was noted, many high-risk production and marketing practices are more common in small-scale poultry-raising, whose relative importance to the livelihoods of producers is poorly understood. These practices include: farming of multiple species of animals within one farm unit, including poultry and waterfowl; housing of chickens over fish ponds; use of untreated chicken faeces as fertilizer or livestock feed; inappropriate disposal of dying and dead birds; use of surrogate birds to incubate eggs of different species; and lack of adoption of ‘all-in, all-out’ husbandry systems. The challenges to adoption of more biosecure behaviour are considerable.

In the general community, especially in communities associated with backyard farms (“sector 4” – see section IV on “Socio-economic impacts of avian flu”), birds commonly enter homes without restriction, children keep poultry as pets and, in many cases, prized birds (especially fighting cocks) and sometimes other birds are housed in the family home. Poverty, but also general lack of public awareness, result in the use of carcasses of sick or dead animals for food rather than establishing why or whether the animal was ill. In Nigeria, the selling of culled poultry has offered a few poorer people their first taste of chicken meat.
Information and the awareness of producers, the public and all levels of services and authorities are critical. Lack of knowledge of avian flu and of appropriate precautions contributed to uncoordinated and delayed culling and continued eating of sick birds in the 2004 outbreaks, or to unnecessary fear of consuming well-cooked meat, leading to low demand and price drops. Anecdotally, greater awareness of the disease has played a fundamental role in the more rapid and appropriate responses by farmers and veterinarians in subsequent outbreaks, especially in Viet Nam. Conversely, this highlights the urgency of creating awareness at all levels in unaffected, but at-risk countries. FAO, UNICEF and WHO have come together to devise systems for grassroots strategies for disseminating information on avian flu.

Market issues relevant to rural poor people also pervade the AI problem, but are often poorly understood and addressed. It is rare to find dead birds (other than dressed poultry) in a live poultry market in Asia. Diseased dead birds are more likely to be dressed and sold. In 1992, live poultry markets in the United States were considered the "missing link in the epidemiology of influenza". Markets were identified as the source of the H5N1 infection in chicken farms in Hong Kong in 1997, when approximately 20 per cent of the chickens in live poultry markets were found to be infected. The same situation was seen in Viet Nam before the 2004 outbreaks.

Movement of backyard- and smallholder-raised poultry to and from wet markets in rural towns and transportation of unsold birds to other, larger markets and eventually cities constitute known but unquantified components of past outbreaks, as well as an uncertain future risk for the spread of outbreaks. The FAO/WHO market-chain study in Viet Nam related to avian flu (Agrifood Consulting International, 2007) examines some of these pathways and risks. A number of high-risk practices are commonly employed in the wet markets of Asia: limited application of good hygiene, cleaning and disinfection; raising of multiple species together and in confined spaces; stacking of cages; poor ventilation; lack of pre-marketing health checks; and lack of training, education and personal protective equipment for stall owners. These high-risk practices include an apparent regional preference for ‘warm’ meat, which in itself is a contributing factor in the persistence of live bird markets in Asia. Another high-risk practice is the returning of unsold birds to the farms from which they came.

Compensation and credit
The incentives for poorer farmers to respond to controls and safer farming practices have generally been given inadequate attention. This has meant that compensation and credit measures have not contributed sufficiently to support control through culling or through rehabilitation of farms after outbreaks. Examination of compensation issues and options has been pursued by FAO and the World Bank in recent consultations and reports drawing on country experiences with avian flu (Hancock and McLeod, 2006; World Bank et al., 2006). Inconsistent or well-below market price compensation rates have led to reluctance to report outbreaks and even to increased movements of potentially sick birds to areas with better rates. Countries such as Cambodia have been reluctant to implement compensation due to the financial burden. Credit measures to assist stricken farmers – such as rescheduling of loans – have also been implemented in a few countries. However, outreach has been highly variable for both compensation and credit schemes, with less reaching small-scale farmers.
Initially there was little guidance, in practice, on whether compensation should be essentially for rehabilitating industry or as an incentive for reporting. The emerging consensus is that it should primarily encourage cooperation in culling activities. Clearly, rates were set too low initially. After a year of outbreaks, Viet Nam held in-depth consultations on appropriate compensation systems and rates. The previously low rates have been increased to 50 per cent of market value to create a greater incentive to cull (Riviere Cinnamond, 2005). Stamping out of diseased birds and those in contact with them is recommended and has been implemented by all affected countries.

However, the need felt by these countries to soften the blow of AI outbreaks and control measures at the producer level has been very varied. Cambodia, one of the poorer countries, has made it very clear that compensation is not and will not be an option. Indonesia has a paid compensation for certain flock sizes (50-10,000) and will probably offer soft credits in the future; however, compensation was only paid to about 3,000 farms. CASERED (2004) noted the need to create a fund that would encourage smallholder farms to report avian flu. The fear of rising costs means governments have to balance vaccination with culling and compensation strategies. FAO animal economic policy staff are now devising a framework for assessing and providing recommendations on compensation and vaccination costs.

Credit measures to support affected poultry production after the outbreaks were applied in some countries such as Indonesia and Viet Nam (Dolberg, Guerne-Bleich and McLeod, 2005). These dealt mainly with loan rescheduling and increasing the amount available without collateral (US$2,000-US$3,300). However, these loans are clearly of interest to slightly larger smallholder and commercial producers only. Most backyard poultry raisers do not use formal lending systems in any case. Even for the smallholders – many of whom became indebted – with the interest on bank loans, the additional credit support was inadequate, and farmers turned increasingly towards informal lending. Understanding the role of credit in reducing pre- and post-crisis vulnerability has received little attention. While compensation and credit clearly play an important role in improving control and prevention measures, as well as in rehabilitation, they depend on considerable resources and effective implementation mechanisms. An agency such as IFAD would have to tread cautiously here, providing models of effective mechanisms and sustainable outreach to poorer farmers.
Avian flu outbreaks and control measures can have significant impacts on livelihoods, particularly where poultry-raising and poultry industries are important to rural households in Asia. The indirect impacts on food security may be very hard to discern and are an area needing considerable further work (FAO, 2006c). This is very important considering the large number of women raising poultry around the world, who provide an important income and supplementary food source for the household. Future outbreaks, more stringent control measures and changes in policies affecting the structure of the poultry sector, such as marketing regulations and development programmes, will also have potentially significant effects on livelihoods. An understanding of the structure and characteristics of the poultry sector in Asia is fundamental to understanding socio-economic impacts on this sector and on the livelihoods of poor poultry farmers.

Structure of the poultry sector in Asia and the livelihoods of rural poor people

Importance at country level

Exact GDP figures from the poultry sector in major affected countries are not readily available, though FAO is working on developing country-sector profiles. In the initially affected countries, poultry comprises about 20-50 per cent of livestock production. Using estimates based on the proportion of meat production from poultry in the livestock GDP (Table 1), poultry contributes 0.8-1.2 per cent of total GDP. Compared with Thailand, none of these countries has a significant trade in poultry (China and Indonesia have only a minor trade). Though the contribution to GDP is generally low, it does not reflect the importance within households in terms of local sales, barter and consumption, and the social position of women, who are the main managers of poultry in all these countries.

Structure of poultry sector

The macroeconomic perspective may not fully capture the importance of smallholder and backyard systems, or, conversely, whether such a perspective captures the importance of poultry to poor people in terms of livelihood and consumption. A recent economic analysis of Vietnamese data (Maltsoglou and Rapsomanikis, 2005) indicates that while livestock is important for sale, poultry meat is mostly eaten, and that poor households are more likely to rely on livestock, have less exposure to markets and be more likely to own pigs and chickens (as opposed to larger livestock).

18 Figures for overall poultry production are available from FAO statistics. As with many statistics derived from national-level systems, they should be treated with some caution.
The poultry sector in Asia is mainly characterized by small-scale, backyard poultry-raising systems (Figure 2). FAO conducted a study on post-avian flu rehabilitation in Cambodia, Indonesia, the Lao People’s Democratic Republic and Viet Nam (Dolberg, Guerne-Bleich and McLeod, 2005). It categorized poultry production systems into the following four types. The characteristics of the subsector categories are summarized in Annex A.

- sector 1: industrial integrated system with high-level biosecurity and birds/products marketed commercially;
- sector 2: commercial poultry production system with moderate to high biosecurity and birds/products usually marketed commercially;
- sector 3: commercial poultry production system with low to minimal biosecurity and birds/products usually entering live bird markets;
- sector 4: village or backyard production with minimal biosecurity and birds/products consumed locally.

These categorizations are not the only ones, but probably the most simple and useful. Nevertheless, for a more detailed understanding of epidemiological and poverty issues relating to avian flu, it may be worth noting that a range of different subsystems exists between sectors 3 and 4. For example, in Indonesia sector 4 may be only a few native chickens, whereas a sector ‘3.5’, as has been observed, may have improved native breeds under semi-intensive production. In sector 2 there may be different degrees of contract relationships with sector 1, which may be more important than the size of farms when it comes to animal health risks and safety.

Poultry-raising and its relationship to poor people and their livelihoods

Sector 4 – village or backyard production with minimal biosecurity and birds/products generally consumed locally – is found in all Asian countries and most developing ones. It is the system of production of greatest relevance to rural poor people (Mack, Hoffmann and Otte, 2005). However, also sector 3 (smallholders) has to some extent been seen as important, as a model pathway for upgrading sector 4 poultry-raising. In the FAO study, there was a substantial sampling of backyard producers only in Viet Nam, together with an examination of the impacts of avian flu on these producers (Government of Viet Nam, 2004), to be dealt with in greater detail further on. Thus the understanding of the needs of poor poultry producers and the impacts of avian flu on them is considerably limited.

In many Asian countries affected by avian flu, a backyard poultry-raising system using 1-50 mainly indigenous breeds of birds dominates by far, generally involving over 90 per cent of poultry-raising households – in poorer countries over 99 per cent (Dolberg, 2003). From 60 to 80 per cent of all rural households engage in backyard poultry-raising. A smaller percentage, probably up to 5 per cent, may be engaged in very small-scale smallholder production (50-150 birds). Women mostly manage backyard poultry (over 80 per cent) and are also the majority in small-scale production, as it fits into other household routines. Farms of greater size are managed by men, due to better access to services, training and markets.

19 At the country level, the FAO study was carried out by local experts, who applied the categorization slightly differently in each country.

20 Indigenous breeds – in Indonesia, ‘kampong’ chickens – often have a greater market value because of better taste and perceived healthiness.
Not all backyard or small-scale producers are poor, but many are. Poverty\footnote{Based on a household income of less than US$2 per day.} in most affected countries in South-East Asia ranges from 30 per cent (Thailand) to 70 per cent (the Lao People’s Democratic Republic). Thus the vast majority of poor poultry raisers will be backyard producers. An estimated 32 million in the most heavily AI-affected countries in East and South-East Asia have a household income of less than US$2 per day (mainly China, Indonesia and Viet Nam \textendash{} Table 2).\footnote{The contribution for China is based on a low national poverty line, thus data on the number of poor will produce an underestimate.} While data are not readily available for Bangladesh, India and Pakistan, a great number of backyard producers and their households exist in these countries as well.

Small-scale poultry-raising has been acknowledged as being of fundamental importance to poor people and especially to rural women (IFAD, 2004). For many poor households livestock is primarily a form of financial capital, of savings, which can be used in building up capital or generating cash quickly by sale in time of need. Poultry, like other livestock, is also important as social capital, in exchanges of gifts and for creating and maintaining community and relational bonds. This has been noted particularly during the various lunar new years in East and South-East Asia. For the women who raise poultry, this can be one of the few assets they fully control and own, and from which they can channel income for household food, education needs and emergencies. In the case of Viet Nam, it has been estimated that the return on having even one or two chickens can be over 600 per cent per year, largely owing to the very low inputs (Otte, 2006).

The household economy and family nutrition are also very important. Studies of the impact of smallholder livestock development in Bangladesh (Nielsen, 1998) found that women poultry producers use their increased incomes to buy more food, send children to school and augment their assets. Support to poultry-raising in very poor households seems to directly improve consumption by children in those households (Karim \textit{et al.}, 2005) – even with an average increase from one bird to two – and it seems to increase household and community status as well (Riise, Permin and Kryger, 2005). Poultry, as opposed to larger livestock, are widely recognized as being the province of women, who, as mentioned, can manage and control them as they wish (IFAD, 2004). This may vary in different regions and countries.

Potential impacts on women’s livelihoods of possible AI outbreaks in Ethiopia have been modelled (Bush, 2006), with regional differences in results, though with smaller income impacts, as there is less dependence on poultry in that country. Nevertheless, it is likely that outbreaks would increase the labour burden of poorer rural women. The case of Viet Nam illustrates the importance of poultry to rural poor women. Some 80 per cent of backyard poultry-raising (sector 4, 1-50 birds) and 60 per cent of small-scale commercial units (sector 3, 50-150 birds), or 11.4 million poultry, are managed by women. Not enough is known about the relationship between poultry and household food security in poor countries; it is estimated that they contribute 20-30 per cent of the total animal protein supply (FAO, 2005b), varying in Viet Nam in relation to the accessibility of markets (Tung, 2005).
Overview of costs and impacts
It is clear from the above characteristics of the Asian poultry sector that AI outbreaks and their control will have significant effects on many poor poultry-raising households. It is important in the context of an IFAD strategy, but also in a wider development context, to go beyond immediate costs and examine the impact on different types of poultry-raising households and on poor people. The costs and impacts of avian flu can be classified as being significant in either the short or the long term. Costs may be borne by government, or impacts and costs by the private sector, such as producers and traders. Effects may be either direct, as a result of animal disease outbreaks and control, or indirect effects from these on markets, tourism, etc. A summary of possible costs and impacts is given in Table 3.

Local effects of the 2003-2004 outbreaks were very severe and caused considerable production and livelihood losses to vulnerable people directly involved in production. As mentioned in section I, direct losses were highest in Viet Nam (44 million birds, amounting to approximately 17.5 per cent of the poultry population) and Thailand (29 million birds, 14.5 per cent of the poultry population). Estimates of the shorter-term costs of the AI outbreaks in 2003-2004 ran into billions. Countries such as Viet Nam and Thailand saw small but significant impacts on GDP. In Viet Nam the losses and costs of control were above US$100 million or 0.1 per cent of GDP (World Bank, 2005a). Against the more direct costs – of addressing the disease at the source in animals and in the management of poultry-raising and services – there are the potential costs and negative poverty impact of the risk of mutation to human-to-human transmitted viruses and a possible pandemic.

AsDB (2005), Bloom et al (2005) and Brahmbhatt (2005) provide various estimates for wider costs of an avian influenza and a possible pandemic.

Impacts on livelihoods of poor people
FAO’s studies under the Emergency Regional Support for Post-Avian Influenza project (Dolberg, Guerne-Bleich and McLeod, 2005) examined the impacts of avian flu and the implications for rehabilitating the poultry sector. The studies were based on surveys in Cambodia, Indonesia, the Lao People’s Democratic Republic and Viet Nam. Only the Viet Nam study provided greater detail, with a larger sample of backyard producers, and is the focus of the following analysis.

More direct effects of poultry deaths and culling
The most severely hit, comparatively, were smallholder, semi-commercial and small-scale commercial farmers, with a specialization in poultry and relatively low biosecurity, few household assets to support them and little technical support. While smallholders are generally not the poorest producers, they may have been pushed substantially under the poverty line in hard-hit areas. Direct income losses for smallholders (50-150 birds) that lost poultry due to culling or death were very severe – on average US$210 – compared with an average monthly income of US$120.

Many backyard poultry raisers are close to the poverty line already. With the fewest safety nets and assets of all producer categories, they suffered small but significant losses. Compared with other producers, individual farm losses were lower for backyard producers – on average US$63 – where average monthly income is about US$90 per
month. However, this will have had a greater impact, especially for the 25 per cent of people already under the poverty line (US$50/month). Such producers would have had fewer initial assets to fall back on, though the survey did not assess these. There were no accurate data on the rates of losses/culling in backyard poultry-raising, though, at an overall national level, the rate of farms culled is estimated at 0.5-3 per cent based on provincial estimates. Even with probable severe underreporting, the number of mostly poor backyard poultry-raising households directly affected by culling or poultry deaths would be over 250,000, or over a million people.

More anecdotally, backyard producers experienced considerable losses. One case study in a Vietnamese village paints a typical picture for such a producer (Delquigny et al., 2004). The loss of birds, of 2.3 months of production and of consumption were estimated to have cost households involved in the outbreak US$69-108 – a large sum when compared with a per capita income of US$2 per day or less. Backyard poultry raisers would also have suffered some loss of income from a drop in poultry sales due to consumer fears. This would be more likely if they did not have alternative livestock such as pigs, whose sale prices rose as consumers switched to ‘safer’ meat.

**Further indirect effects of rehabilitation difficulties and market shocks**

The FAO study in Cambodia (Agronomes & Vétérinaires sans frontières (AVSF), 2004), while generally identifying fairly limited direct impacts on backyard producers and smallholders, also examined the effects of consumer fear on prices. The drop in demand for poultry meat was identified as being of much greater effect than actual bird deaths, or culling, which was minimal and not taking place on smaller farms. However, due to the normally low prices paid to small-scale chicken farmers, total loss of profit per farm was only US$5.4 per quarter for flock sizes of less than 40 birds.

Nevertheless, with an estimated 800,000 farms in the main affected provinces, this would be a cumulative loss to small-scale farmers of US$4 million. This is significant in a country where average rural income is US$280 per year. The changes in food habits reported by 36 per cent of smallholders also need to be taken into account. Simplistic criteria for compensation may have created disparities in impacts as well. From discussions with officials in Indonesia, it appears that smallholders and backyard producers lost out comparatively on compensation: the paperwork involved for registering losses was considerable, and only farms with 50-10,000 birds could apply.

Market regulations as part of longer-term prevention strategies can also have differentiated impacts on small and large producers. The FAO/WHO study on poultry market chains near Hanoi and Ho Chi Minh City in Viet Nam (Agrifood Consulting International, 2007) examines the effect of stringent regulations on transport, quarantine and slaughter of poultry for city markets. The overall qualitative effect is that market chains for smallholders and backyard producers are becoming more restricted. At the same time, more commercial and industrial producers are increasing their share of sales, with new opportunities in supermarkets and specialized safe poultry outlets, even in nearby provinces. This is partly driven also by changes in consumer demand: there is increasing demand by more middle-income households in cities and larger towns for processed poultry products.

The outcome of these changes may have resulted in disparate impacts on men and women, with women becoming worse off, as they mostly manage backyard and
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smallholder poultry-raising, but this assessment is at an early stage. Consumers in Cambodia, and also presumably elsewhere, especially in poorer urban areas, may have paid a high cost for the epidemic, with possible food-security implications (Dolberg, Guerne-Bleich and McLeod, 2005).

Future trends and policies facing poor poultry producers

Longer-term strategies for increasing the effectiveness of AI control and prevention are likely to have different effects on different types of producers (McLeod et al., 2005) and to contribute to changes in the poultry sector. In particular, the option of direct restructuring of the industry to enhance biosecurity and reduce AI risks in production and marketing is likely to bring on the following types of structural changes and possible costs to small-scale producers: more-concentrated markets with fewer, larger producers; live poultry markets with upgraded infrastructure outside of cities; and requirements to fence and house all poultry, including ducks.

Smallholder and backyard poultry raisers are likely to bear a considerable part of the burden of these structural changes – a broader trend in future livestock development (Delgado et al., 1999). Confinement of poultry would mean costs for feed and enclosures that would tend to make backyard and very small-scale smallholder production unprofitable. Long-term restructuring of the sector towards fewer, more-integrated, safer units – through compartmentalization and zoning of biosecure production (into certified units or zones) – would have very high costs in loss of income to a great number of smallholder producers.

Many would also have high costs if they were to move the location of their production. If farmers were unable or unwilling to move or change poultry practices, there would have to be reparation or other support programmes over the long term. To offer all backyard households the option to upgrade and become biosecure, should this be feasible, or to turn to new livelihood options could cost over US$500 million in Viet Nam (McLeod et al., 2005). This would ideally be in some form of credit, although the appropriate mechanisms have not been yet established.

More stringent market requirements and more centralized slaughter will also reduce the competitive advantage of smaller producers. As has been noted from ongoing studies in Viet Nam, this may already be happening. However, such restructuring may be taking place even without avian flu. Nonetheless, the speed of change may impact poor people more, as they have fewer resources with which to adapt. A study23 using Vietnamese data calculates that a policy of eliminating backyard and smallholder poultry-raising would disproportionately affect poor people: some would lose more than 25 per cent of their income. If all backyard poultry-raising were banned (Otte, 2006), income foregone would be on the order of 8,600 billion Vietnamese dong or US$550 million per year. This is equivalent to some 5 per cent of agricultural GDP, or 2.5 million full-time jobs at minimum rural wage rates.

23 The FAO Pro-Poor Livestock Policy Initiative, in cooperation with the University of California, Berkeley and the Royal Veterinary College, London, has modelled the effects on 600 households sampled from the 2002 Viet Nam Household Living Standards Survey (Otte, Roland-Holst and Pfeiffer, 2006).
Challenges to and support for rural poor people

There is clearly a need to address the present and future socio-economic impacts and costs, as well as longer-term consequences of avian flu, especially for poor people. Even though impacts at present may seem relatively small for individual backyard farmers, they form the largest poverty group most directly affected or potentially threatened by control and prevention measures. To address impacts on rural poor people, key socio-economic and policy challenges of avian flu should be considered:

- real needs of backyard and smallholder producers;
- appropriate biosecurity for smallholder poultry producers;
- feasible, large-scale opportunities for livelihood alternatives;
- more pro-poor options and mitigation of control and prevention measures in market chains and zoning mechanisms;
- international coordination and resources for long-term socio-economic concerns, which lag behind emergency efforts.

FAO is beginning to structure a programme on socio-economic and policy issues of avian flu through ECTAD, often collaborating with other agencies at the country level. Germany and the United States are supporting the testing and strengthening of community-based surveillance activities in South-East Asia. The Government of Denmark reallocated considerable resources to longer-term projects on small livestock development in Viet Nam, incorporating smallholder poultry support into emergency measures and stakeholder awareness-raising. FAO and the Department for International Development (DFID) are initiating research into the pro-poor issues of avian flu (http://www.hpai-research.net/index.html).

NGOs such as AVSF have assisted in studies of the impact on various producers in Cambodia and Viet Nam. FAO and AVSF have developed community-level materials for building awareness among producers for identifying and responding to avian flu (available in Bahasa, English, Khmer, Lao and Vietnamese – FAO, 2005a). Various NGOs are working on communication tools for pandemic preparedness and smallholder awareness. The Network for Smallholder Poultry Development has a task force of specialists providing quick, qualified responses to in-country partners.

FAO and the World Bank are both committed to addressing the socio-economic concerns of rural poor people, but have overwhelmingly focused on emergency concerns, in a few cases collaborating on these issues (e.g. compensation). Assessment of the impacts on farmers and their needs has been carried out mainly by FAO. More recently, through ECTAD, FAO continues to examine certain AI socio-economic issues: community institutions, market chains, trade and food-security issues at local and country levels. It is encouraging networking and is assisting countries with compensation and restructuring.
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Particular threats to IFAD-supported projects and beneficiaries

Avian flu provides an unusual situation for the standard categorization of crises and United Nations responses. Backyard and smallholder poultry raisers may both contribute to and be exposed to risk. Priority IFAD target groups – especially rural poor women who form a majority of backyard poultry producers – may see the impact of outbreaks and would be targeted, to a great degree, by future restructuring and biosecurity upgrade plans. To date, they have been given little consideration in ongoing or planned government and donor spending programmes to prevent and control avian flu.

However, there do not seem to have been any major direct impacts on IFAD-assisted project beneficiaries from the 2004-2005 outbreaks in affected countries. To some extent, this may be due to the fact that IFAD-supported projects in these countries have been in more remote areas. In these areas there are generally fewer extension, veterinary and livestock services per farmer, and a greater proportion of backyard and very small-scale smallholder poultry-raising, with little detailed monitoring and diagnosis of disease outbreaks. It is well known that major outbreaks of disease, often of the similar Newcastle Disease, are not unusual in backyard poultry.

Based on FAO data, outbreaks have occurred in IFAD-funded project provinces in China, Indonesia and Viet Nam, though only in one or two cases in the same districts and counties. These outbreaks may well have affected local areas with IFAD-assisted projects, including some of the more indirect and unquantifiable impacts such as price and consumption effects. Based on AI epidemiology (where greater risk is associated with rice farming related to duck-raising and intensive poultry-human density areas), remote project areas are often not considered the highest impact or risk areas. Nevertheless, a small-poultry breeding improvement component was suspended indefinitely in a project in Ha Giang, in Viet Nam, as the district had suffered recent outbreaks. The project monitoring mission made this decision as a safeguard action, as it did not have the specialist input to say whether continuing the local breeding support would, in fact, contribute to reducing the risks from imported poultry.

Nevertheless a combined analysis of proximity to higher risk areas for avian flu (Figure 1) and the distribution and relevant components of IFAD-supported loan projects in key countries (Annex B) highlights the potential for area prioritization of IFAD engagement, while bearing in mind that no area with poultry-raising is entirely safe. The analysis highlights some projects of key interest, both from the point of view of risks and as contributing useful and more widely applicable lessons on how to deal with those risks:

Bangladesh: the Microfinance and Technical Support Project has examined the relationship between poultry development and microfinance.

China: the West Guangxi Poverty-Alleviation Project supports livestock extension and veterinary services and their links to the grass-roots level, as well as accessible microfinance for women in densely populated areas for pig and poultry production.

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**Indonesia:** the microfinance-focused P4K - Phase III, covering a large number of rural poor people in Java, provides microcredit for livestock to rural poor people, including women.

**Viet Nam:** the Programme for Improving Market Participation of the Poor in Ha Tinh and Tra Vinh Provinces focuses on high-density poultry and duck production areas.

The risks to IFAD-funded projects may increase with a shift in IFAD emphasis. This would be the case with more market-oriented projects covering livestock, such as the one presently being formulated in the Mekong Delta.

**IFAD experience and lessons learned**

Avian flu is an animal health issue – with risks for and impacts on rural poor households – in which IFAD can play significant role. While it is not primarily a crisis-oriented organization, IFAD nevertheless allocates more resources to low-income countries under stress and conflict than most multilateral agencies. It also has experience with smallholder livestock producers and poor poultry raisers, rural women’s livelihood development, and community interventions that can assist in the delivery of services to poor people.

IFAD has experience in dealing with risk and conflict, man-made disasters, natural disasters such as tsunamis, drought and cyclones, and global health threats such as HIV/AIDS. While not all features of conflict and emergency situations apply to avian flu, there are common features in terms of applying urgency, flexibility and sensitivity to the addressing of risk and vulnerability. In all cases, moving development upstream to prevent and mitigate crisis is desirable.

A review of a sample of projects approved in recent years to respond to conflict and stress situations reveals a number of potentially useful features and lessons. Investing in the local economy and livelihoods has been seen as essential in IFAD-assisted projects. This is relevant to avian flu, both to reduce the risk of social disruption and to address post-crisis situations. In the case of avian flu, great caution will be needed in such investments in terms of expanding and rehabilitating marketing and production systems, so as not to increase risks of disease. A strong emphasis on the need for capacity-building among poor people, on their livelihoods, and on strengthening institutions to support them is a comparative strength of IFAD that has not otherwise featured in discussions about addressing avian flu in the long term.

**Poultry and livestock experiences**

There are potentially important lessons from the Bangladesh poultry model (BPM) for enhancing poor people’s poultry production and alternative livelihoods. The BPM has received intensive support and development over the last 15 years from national NGOs, IFAD and other donors. Conceived in the 1980s by Bangladeshi NGOs, the BPM’s aims were to improve poultry rearing – in which rural poor households were already engaged, but at a very small scale – so that it could become an income-earning activity
for a large number of landless, poor women. With improved poultry-raising by poor people and strengthened support services, higher incomes would lead to greater opportunities for the raising of other livestock and for other livelihoods.

IFAD’s first involvement was in the period 1992-1998, when, together with the Danish International Development Assistance (DANIDA), it supported the Smallholder Livestock Development Project (SLDP), based on implementation of the poultry model. By the late 1990s, the typical model centred on key poultry rearers, nearly always women, with about 10 improved hens, supported by a number of small-scale entrepreneurs who provided the inputs and services needed to maintain the flock. The key rearers were brought together by community groups, awareness programmes, training and access to microcredit, essentially supported by NGOs.

Several of the inputs and services required access to the Department of Livestock Services (DLS), particularly increased animal health practices such as poultry vaccination. A number of rapid assessments of diverse poultry projects in Bangladesh indicated that reduced poultry mortality and improved services resulted in various projects’ participants benefiting positively in terms of income, consumption, nutrition and empowerment of women. By 1997, 1.3 million women were involved in small-scale poultry production under the poultry programme of the national NGO Building Resources Across Communities (BRAC).

While some problems of the BMP were identified in the early 2000s (Kryger et al., 2005), a more recent IFAD-supported project has shown that these can be overcome and benefits to poor poultry producers sustained. The IFAD-funded Microfinance and Technical Support Project (MFTSP), which began in late 2003, was conceived as a follow-up to the SLDP. Shortly after its start, a DANIDA review of the poultry model concluded that it was flawed and not as successful as had been thought. Among other considerations, there were concerns expressed about the high rates of beneficiary dropout (35-50 per cent) before and after some projects ended.

A comprehensive assessment by Fakhrul Islam and Jabbar (2005) identified further concerns regarding the sustainability and complexity of many past projects. The poultry model was less successful in reaching the poorest women and those in remote areas with limited access to markets. In areas with better market access, on the other hand, the higher intensity of poultry production increased the effects of market competition, for eggs in particular. Many of the benefits of the NGO/DLS donor projects have been due to their heavy dependency on the partner NGO microcredit programmes, and failings, on the other hand, have been to a large degree due to insufficient technical support.

Nevertheless, the initial experiences of the MFTSP are now demonstrating that by addressing a number of weaknesses seen in earlier projects, the model can work well and generate significant income for poor women. Areas where the MFTSP has departed from earlier projects include: (i) better design of the microcredit programme based on accepted microcredit best practices; (ii) demand-driven implementation of the poultry model – that is, a bottom-up approach, rather than the previous top-down one; and (iii) improved training and better management of training and technical support. The project is also supporting a range of other livestock enterprises, so that people may choose what suits them or respond to market opportunities, as well as diversifying their

25 Department of Livestock Services, within the Ministry of Fisheries and Livestock.
risks away from a single income source. Poultry input enterprises are now working well, partly because they are based on real market needs and partly due to better training and technical support. Lessons indicate, in addition, that alternative safety-net mechanisms may be needed to reach the poorest people.

IFAD has also gained experience and learned lessons through other livestock development projects and project components. While many of the projects concern rangeland and pastoral beneficiaries, they reinforce the BPM lessons: the need to focus on gender and the household needs of livestock-raising families; and promotion of cost-effective, grass-roots services such as the use and support of community-based animal health workers. Similarly, they emphasize the importance of considering and managing risk by addressing diversification and market issues and through community-based early warning systems (IFAD, 2005).

Other relevant experiences: rural finance, poverty focus and outreach
The AI crisis has shown the importance to poultry raisers, especially women, of building up assets and having financial support for a variety of livelihoods. IFAD has extensive experience in savings build-up and microcredit, either as components of rural development projects or as projects in their own right, mostly with a focus on rural poor women. Poor livestock raisers are included in IFAD rural microcredit experiences in Bangladesh, Viet Nam, and the large P4K - Phase III project in Indonesia. IFAD is working on similar projects in China, such as the Rural Finance Sector Programme, in order to formulate models for rural livelihood development based on microcredit systems.

Nevertheless, IFAD experience, and indeed that of other donors and NGOs, indicates that microcredit cannot be seen as a straightforward solution for the poorest rural women. Other safety-net instruments must be identified and developed, such as employment schemes and cash transfers. Other useful and frequently applied IFAD project mechanisms could provide important tools for reaching out to large numbers of AI affected and vulnerable poor poultry raisers. Outreach and participatory mechanisms used in larger investment projects include: participatory rural appraisal (PRA) to identify real local needs and opportunities; targeting of poorer households and women; and development of responsive smallholder research and extension services. Experiences from the management of community development funds could be explored in order to identify useful mechanisms for delivering financial support at the community rather than the individual level.

Limitations and scope for IFAD engagement
The main scope for IFAD’s engagement with avian flu is likely to be on longer-term issues: investment activities in poorer countries and with poorer people, with limited direct technical input. IFAD activities are generally strategic and development oriented, with a focus on country-owned investments, and thus best suited to addressing such longer-term issues. Compared with other multilateral investment agencies, projects are
small and should focus on innovation and more directly on poverty issues. IFAD concentrates on a set of poorer countries and poorer, if not the poorest, target groups. In Asia, it also places a high priority on more remote rural areas, in particular involving indigenous peoples.

Project design commonly takes one to two years, and projects are initially identified in longer-term country strategic opportunities programmes (COSOPs), with some exceptions, for example some smaller tsunami rehabilitation projects. Aside from investment resources, IFAD research funds at country and regional levels mainly support the development of country strategies and programmes, and focus on poverty reduction issues. It has limited staff and technical resources, mainly based in Rome. In partner countries, the Fund generally operates through project coordinating units.28

28 This may change with the proposals to establish country teams.
Overall goals and objectives

Based on key AI issues and IFAD’s experiences and limitations, the overall goals of IFAD should primarily be to: (i) contribute to mitigating the ongoing negative impacts of AI outbreaks and control measures on the livelihoods of poor poultry farmers; and (ii) reduce the risk and vulnerability that may undermine poverty reduction and IFAD-funded projects, while at the same time increasing the biosecurity of poultry-raising. Progress would be indicated by:

- poor poultry producers’ livelihoods enhanced or at least maintained (particularly those of rural women), either through improved production practices or alternative livelihoods;
- poor poultry producers’ practices made more biosecure, in terms of both animal and human health risks.

IFAD’s more immediate objectives in relation to avian flu should concern two main areas. First, it should develop the mechanisms for reducing vulnerability and strengthening the livelihoods of poor poultry-raising households. IFAD’s aim here should be to enhance and develop systems for safe and viable poultry (and pig) production, as well as opportunities for alternative livelihoods for those wishing to move out of poultry-raising. Key indicators of progress could include:

- poor poultry raisers and their communities made aware of key risks, appropriate control and prevention actions and opportunities for enhancing response systems;
- mechanisms developed for effective zoonotic disease control and prevention that poor households and livestock raisers could apply (including compensation systems);
- veterinary and extension systems strengthened to provide appropriate support to poorer poultry (and pig) raisers, both to increase production biosecurity and to respond to outbreaks;
- mechanisms strengthened and scaled up for delivering financial and business support to poor poultry raisers and their households, both to upgrade production and to access alternative livelihood opportunities.

Second, complementary to the above objective, IFAD should contribute to the development of pro-poor policies and institutions. Here the aim should be appropriate pro-poor regulations and instruments for addressing zoonotic diseases. These could be monitored through:

- enhanced awareness among key stakeholders and positive changes in policies and programmes, which take into account specific needs of poor poultry producers and poor consumers;
• effective policies and programmes that reflect vulnerabilities and real risks of poor producers in different areas, using appropriate mitigating actions – such as geographical targeting or regulations – and suitable livelihood support.

**Short- and long-term priorities**

IFAD priorities are to mitigate AI impacts and reduce vulnerability, rehabilitate affected poultry farms and foster sustainable poultry-raising systems through enhanced biosecurity in the poultry sector. **In the short term**, IFAD should focus on minimizing risks to ongoing and planned projects and on developing appropriate systems and partnerships for information-sharing:

• establish a crisis response system for avian flu and other zoonotic diseases covering internal procedures for communication and planning;
• initiate dialogue with international agencies such as FAO and the World Bank on information-sharing, identifying country-level policy priorities and establishing partnerships;
• identify and assess the impacts, vulnerability and risks of existing and proposed projects in order to identify possible beneficiaries at risk and measures to be taken;
• assist governments in strengthening information flow from the central to field level and back through existing IFAD-supported projects. Projects could be used as communication channels (through mission, project formulation and field operations) to identify urgent local AI issues and communicate appropriate responses to farmers, the community, community-based organizations and NGOs. Involve project staff, partner agencies and country networks;
• use approaches such as participatory rural appraisal to identify priority target groups and assess their longer-term livelihood and support needs. Identify support mechanisms for crisis mitigation among poorer people;
• encourage knowledge management and sharing within and among countries and international agencies, particularly regarding experiences of poor people’s conditions and livelihoods options and of socio-economic analysis in relation to avian flu.

**Medium and longer-term priorities** should be to identify pro-poor policy recommendations and to develop models for mechanisms that minimize the impacts of control and prevention and maximize benefits to poor producers. These will be partly based on IFAD’s own rural development experience:

• formalize partnerships with agencies such as FAO around key policy and information themes regarding AI and zoonotic disease impacts and mitigation for poor people. Collaboration could be established with multilateral and bilateral agencies on specific investment projects at the field level to support poor poultry-raising households;
• strengthen support for community-based animal health services to increase the biosecurity and sustainable development of the poultry industry for those producers wishing to continue poultry production, especially for smaller farms. Identify means of strengthening collaboration between grass-roots and decentralized veterinary services and central line agencies to effectively manage control and information-sharing;
• identify mechanisms for livelihood strengthening and diversification into other livestock, agricultural and non-farm livelihoods for poor poultry owners. Assist in the establishment of self-help funds and matching funds as possible delivery mechanisms for compensation and livestock group development;

• support the development of appropriate rural finance/microcredit systems for poor poultry producers – this may be a particular area of IFAD comparative advantage. It would also offer opportunities for rapid substitution of income sources should the market (or the disease) dictate such a move, but it requires further assessment and improvement of the degree to which microfinance institutions reach the poorest people;

• develop community information systems and capacity-building of extension services to provide demand-driven support to poorer smallholder and livestock raisers. This should include community information systems for the reporting and delivery of emergency public information. Capacity-building and systems for local agencies would be needed in order to provide cost-effective technical and enterprise development services to poor people. In Bangladesh, through IFAD-funded projects such as the MFTSP, there is an effective network of poultry workers, who could be trained to provide consistent, rapid animal health information to village poultry raisers. However, the capacity to deliver participatory and pro-poor extension services has to begin at the top, and this is where IFAD could play a role. Experts could be brought in to train leaders and leading technicians in NGOs and other partner agencies, especially where IFAD has significant links with livestock agencies;

• in support of the above activities, incorporate into projects the development of community institutions of women poultry producers and local veterinary associations with outreach to poor people. Bring together local extension agents and broader community groups to support them as well.

**IFAD strategy and priority actions 2007-2010**

IFAD could implement activities to address the above objectives and priorities primarily through its regular country-level investment operations, with support from the regional and corporate levels. Key strategies would be to: (i) establish appropriate policies, procedures and partnerships to address avian flu and similar zoonotic crises; (ii) support or carry out assessments of risk of AI for ongoing and planned projects and their beneficiaries. Assessments should also identify opportunities and best mechanisms for project support to beneficiaries; (iii) implement improvements – through modifications of ongoing projects where possible or in planning new ones – in production biosecurity and enhancement of livelihoods to assist project beneficiaries in recovering from crisis or reducing their vulnerability to future animal diseases (and control and prevention measures); and (iv) engage in policy dialogue to align animal disease control and prevention measures with poverty reduction strategies. Recommended strategies and options for action at the different levels are given below.

**Country level**

At this level, key strategies should focus on four areas: (i) assess overall risks to projects and monitor regulations and programmes that have implications for ongoing and
planned projects; (ii) support project target groups affected or immediately threatened by avian flu or other major zoonotic disease outbreaks; (iii) identify, develop and promote systems of safe poultry development and alternative livelihoods for poor people; and (iv) support countries in the development of appropriate pro-poor regulations and instruments for addressing zoonotic diseases.

First, IFAD should assess and monitor actual and potential risks to and impacts on ongoing and planned country projects. This process should be conducted by country programme managers (CPMs), project coordinating units and partner agencies – with necessary expert support – in the phases of COSOP development, project identification, appraisal and monitoring. It could include the following activities:

**Overall situations for avian flu and ongoing support activities** would be obtained formally from government animal health services, but also from FAO country offices, the World Bank (preparedness assessment reports) and other agencies with livestock interests. FAO is preparing a rapid assessment checklist tool to identify key information for prioritizing socio-economic, institutional and policy concerns in relation to avian flu.

To what degree do projects contribute to small-livestock development and/or are exposed to poultry components? This assessment should identify countries, regions, projects, project areas and target beneficiaries at risk from avian flu, as well as the importance and potential of poultry-raising for the livelihoods of the target group, especially of poor women. Project contribution could be either direct – through specific livestock components focusing on poultry and pigs in particular – or indirect – through significant livelihood support involving target groups in poultry- (and pig-) raising or through microcredit support. At country and project levels, the assessment should cover risks due to proximity to hotspots (duck-raising and wetlands, high density of poultry-raising, high human population density and illegal import areas for poultry products) and the extent of poultry sales to local and other markets.

Changes should be recommended in target areas, target groups and project components where possible so as to include more-affected and at-risk groups for project benefits and to align technical service inputs with recommended practices. Extra flexibility in the use of project resources, perhaps under specific components, may be needed in high-risk or crisis situations. In projects with a high degree of project involvement in poultry and vulnerability to and risk of avian flu, extra consultation and expertise on avian flu should be included in project support. This should involve experienced smallholder production and livelihood specialists.

There should be monitoring of potential changes in regulations, policies and programmes by country-related and regional staff. This would identify updated national and local regulations and expected actions in terms of prevention and control – particularly limitations on or high sanitary standards for production, transport and marketing of poultry that would affect producers. During project reviews, it would also be important to assess changes in livestock market opportunities and channels due to animal disease outbreaks, changed regulations, trends in demand and shifts in policy.

Second, in the case of projects directly affected or immediately threatened by avian flu or other major zoonotic disease outbreaks, project teams and partners, together with local animal health agencies and administrations, should assess risks and impacts and take appropriate safety actions to assist in beneficiary recovery.

29 The impact assessment tool has been refined based on work in Egypt and Turkey – and in the future possibly Cambodia and Nigeria (J. Curry and A. McLeod, ECTAD, FAO, pers. comm.).
Assessment of ongoing outbreak risk and the severity and patterns of spread in project and neighbouring areas would be needed, together with a complementary, rough assessment of the degree of dependency on poultry and the number of households affected or at risk in project areas.

Expected services, actions and resources, and the responsibilities of government and livestock raisers for biosecurity procedures and disease communication systems should be assessed. CPMs, project coordination units and supervision missions could identify other sources of support in the country or region: central agencies, FAO, more-specialized and better-resourced projects, NGOs, etc. In urgent cases lacking alternative support, the possibility of resource reallocation from existing projects should be examined, either from IFAD or other potential partners.

In the case of severe outbreaks, immediate emergency responses should be effected in project areas. All IFAD-supported staff, missions and consultants should receive briefings by local animal health services on risks, personal safety measures, key information for farmers – especially on safety reporting and compensation – and the communication system. Flexibility is recommended in the realignment of funds if a project is heavily affected. Such realignment could be directed towards the following types of priority support within project areas:

- assistance with the assessment of risk and impacts in the area;
- critical minor equipment for surveillance in project areas;
- urgent transport of sample material for diagnosis;
- channelling of information and liaison with local authorities and, informally, with public health agencies.

During actual or threatened outbreaks, projects should be linked closely with central animal health authorities to increase the effectiveness of support and feedback. In the short term, this could mean the establishing of communication systems between producers and local and central animal health agencies, taking advantage of project field structure where possible (local agency extension agents, community mobilizers, poultry workers). Project management could assist authorities in the identification of affected households, if necessary assisting the households in registering for compensation or other recovery support. The affected households and at-risk groups should be targeted for safe poultry development or other livelihood development. Project staff could contribute detailed observations on AI patterns and impacts through project partners’ agencies.

Third, for planned projects within high-risk areas, or that deal specifically with poultry and pigs, CPMs and project design teams should identify, test and promote systems for safe poultry development and alternative livelihoods for poor people. Using specialist input, this should consider best practices for small-livestock and community veterinary activities and microcredit. Based on IFAD’s comparative strength and local experience, the following options might be suitable for further assessment during the design process: rapid communication systems for dealing with animal diseases; viable options for upgrading biosecurity for small-scale poultry-raising; local and community funds for veterinary services and as informal compensation schemes; self-help groups with informal and formal microcredit schemes supportive of small-scale livestock-raising; and viable livelihood diversification.
Fourth, IFAD should be actively involved in policy dialogue on the development of appropriate pro-poor regulations and instruments for addressing zoonotic diseases. This should take place through assessment of issues and dialogue with government partners, and through partnerships and collaboration with other donors, for example country-level, livestock donor working groups.

IFAD should gather information on risks, impacts and pro-poor measures in collaboration with other agencies, identifying and assessing characteristics of subsector and AI risks and hotspots, and identifying and quantifying relevant ongoing and future impacts of control and prevention measures on poor people. Possible pro-poor mitigating actions in AI control and prevention could be identified, such as differentiated implementation of regulations in rural and more-urban areas, appropriate grass-roots support and incentives to poor households to leave the poultry sector.

Such information can be used in establishing dialogue at the national level on pro-poor policy issues of animal disease control. Such dialogue could be in relation to specific regulations guiding animal and public health or to wider support policies in the poultry and livestock sector, including relevant aspects of poverty reduction strategy papers (PRSPs) and their implementation. This might well include promoting effective local animal health and livestock extension systems in decentralized contexts – systems that reach out to poor people.

The following are possible modalities of IFAD engagement in policy dialogue at the country level: through project monitoring and evaluation activities and related discussion of project issues with governments during CPM field visits and supervision missions; during consultations and negotiations in the COSOP development process; during negotiations on the development of new projects; and as part of the collaboration with other projects in the development and monitoring of PRSPs.

The priorities for short- and long-term strategies and activities would vary on a country-by-country basis. Box 1 offers examples of possible priority actions in selected key countries. In addition, IFAD should be prepared to provide a rapid response to requests from AI-affected countries. Box 2 provides a summary of suggestions for preparing such a response.

Regional level

Key areas for regional-level action by each IFAD regional division would be support of country-level activities through information and policy material and engagement with regional-level policy developments. First, regional divisions should support country-level project cycle activities such as assisting CPMs in identifying options for appropriate pro-poor regulations and livelihood support mechanisms for target groups, with appropriate analytical work on countrywide lessons. Topics for this work could be the zoonotic risk posed by and to poorer poultry raisers; socio-economic impacts of avian flu; and future trends and prospects for smallholder livestock development. Divisions should encourage the use of IFAD-supported and other projects as networks, pilots and case studies within and between countries for knowledge-sharing.

Second, IFAD partnerships should be strengthened or created to support policy dialogue. Linkages should be established to develop wider knowledge on poverty issues and avian flu with AsDB, the Consultative Group on International Agricultural Research (CGIAR), the International Livestock Research Institute (ILRI), OIE, WHO, the World Bank, bilateral agencies (the Australian Agency for International Development
Box 1
Examples of immediate IFAD actions to address avian flu in selected countries

Viet Nam
Link IFAD with existing FAO, donor and government departments in dialogue on proposed policies for restructuring the industry towards a more-centralized and industrialized system. Such dialogue would foster understanding of potential impacts on projects and on opportunities. Further analysis of the possible banning of backyard poultry and its effects on poorer farmers is a priority.

Carry out a case study examining practical options in Viet Nam for supporting smallholders and backyard farmers in the face of constraining markets – either immediately, as a result of AI control measures (e.g. marketing bans), or as a result of longer-term market changes owing to government policies on upgrading of market biosecurity and higher marketing standards. Smallholders could be supported through upgrading of biosecurity and/or options for alternative livelihoods and the support systems these would need. This could build largely on the FAO/WHO market-chain study (Agrifood Consulting International, 2007) – examining in more detail the differences between producers in different rural areas and of different poverty levels.

Assess appropriate microcredit in support of alternative livelihoods for rural poor women – for example the experience of the Viet Nam Women’s Union – and prepare a policy briefing.

Indonesia
Seek to better understand the backyard poultry sector, its relation to avian flu in Java and the actual and potential impacts on poorer households of outbreaks and market changes.

Examine dependency and opportunities for the rural and peri-urban poor in the sector, as well as options for alternative livelihoods. Assess the role of microfinance and related support services in reducing AI risks and improving livelihoods.

China
Assess risk areas and target groups, particularly in southern China (including Guangxi), and local ongoing and planned regulatory activities.

Evaluate the outreach of county and township extension and veterinary services to poor people, especially for small-scale poultry- and pig-raising by women, in order to identify key areas for support and policy recommendations.

Bangladesh
Together with the central authorities and FAO, identify potential AI hotspots in terms of risk of outbreaks: areas of high-density poultry (particularly ducks) and human populations and proximity to wetlands.

Compile experiences of the MFTSP in alternative livelihoods for poultry raisers and appropriate microcredit systems to support these livelihoods.

Test and develop support mechanisms (training, coordination, technical back-up) for rapid disease outbreak communication systems that are effective to the smallholder and backyard level. Take advantage of IFAD-funded projects and partners as networks in developing these mechanisms.

(AusAID) and United States Agency for International Development (USAID), NGOs and existing poultry networks. With such partnerships and networks, IFAD could identify key country and regional entry points for policy discussions, and could support policy workshops and knowledge-sharing on country case studies at the regional level.

Collaborate with FAO and regional economic networks to contribute to the establishment of regional partnerships – through key regional economic bodies (e.g. the ASEAN livestock group) – and to support policy dialogue at the regional level through policy studies and consultations to evaluate and recommend pro-poor poultry development policies. Other possible partners are the World Bank and AsDB.

30 GRAIN and AVSF have been involved in analysis of AI and its impacts.
31 The Danish Network for Smallholder Poultry Development and the FAO International Network for Family Poultry Development (see ‘Institutional websites’ in References).
32 Drawing on joint FAO/IFAD experiences in regional animal disease surveillance networking (FAO and IFAD, 1996).
Assessment of likely impacts of avian influenza on rural poverty reduction in Asia

Box 2
Guidance on responses to country requests for assistance during outbreaks

1. Assessment of nature and scale of problem
What are the size and pattern of outbreaks and their proximity to IFAD-supported projects? Which IFAD-funded projects are at risk?
How relevant is the problem to IFAD, what type of IFAD-assisted projects exist in the area, is there overlap with target groups, how similar are outbreak areas to IFAD project areas? Are there risk areas that neighbour IFAD areas?
What is the nature of the request, does it fit in with IFAD’s recommended strategy? Is it more technical (e.g. equipment), which may be less suitable for IFAD funding, or does it directly address needs of poorer poultry producers?

2. What are the activities of other agencies – which may be in a better position to respond?
What are their responsibilities, activities and resources available: government (in case of NGO request), donors, NGOs, etc.? Have requests been made to these sources first?
What amounts are available for the specific type of request? How fast could they disburse (faster than IFAD)? Are there major and IFAD-relevant gaps in funding that the request is addressing?
Internally to IFAD, are there any possibilities for reallocation, cofunding with partners (e.g. WFP) or larger multilaterals (e.g. World Bank)?

3. Possible, limited rapid IFAD responses – some initial suggestions
Assistance with assessment and risk if a significant number of poor poultry raisers are at risk, particularly in project areas.
Urgent small equipment for project areas, for example for improving surveillance and reporting, and assisting local health workers in collaborating with producers to identify and control problems in the backyard and smallholder subsectors.
Channelling information to and from central agencies, FAO and livestock NGOs on impacts and policy issues.
If necessary, consider shifting future and planned project areas and components to reduce risks, minimize impacts or engage poultry producers in reducing their vulnerability and improving their livelihoods. In severe outbreaks affecting projects, consider changes in project allocation and targeting with similar aims.

Corporate level
At this level, the main responsibility is to develop a new strategic framework for crisis management. This includes incorporating considerations of crisis, risk and vulnerability into other strategic documents such as regional strategies, COSOPs, projects, etc. It also involves the development of response systems to crises, such as internal procedures, and guidance for project development, such as: structures to deal with specific types of crises systematically, including the necessary professional staff; information collection, analysis and distribution; and detailed response activities for different types of crises. In relation to avian flu, key aims at the corporate level would be to establish coordination and technical back-up at regional and country levels, guide overall policy on avian flu and similar crises, and establish the necessary partnerships at the international level to support these aims.

For further follow-up work and coordination, it would first be important to establish a response and communication structure at the corporate level – as focal points internally and as contact points for external work. This should include an overall livestock policy advisor at the corporate level for public and partner contact. Appointment of smallholder livestock technical staff should be considered. Focal points by region would be needed in order to provide guidance and technical references to CPMs. Relevant staff need to be informed of internal and external communication flow and information resources.
Establish a response system for information and external liaison at corporate, regional and country levels. With the ongoing spread of outbreaks in Asia and elsewhere, CPMs may require quick responses to questions relevant to the local level.

Establish a more formal link with ECTAD as an entry point for technical and socio-economic information and specialist contacts and for guidance on international responses. As a first step in exploring socio-economic issues related to avian flu, exchange regular information with ECTAD’s socio-economic and policy group (also attended by WFP). A discussion on joint positions on these issues should be explored with FAO and WFP.

Explore further collaboration at the global level with AsDB, the World Bank, bilateral agencies such as DANIDA, DFID and AusAID, and NGOs that have shown interest and have had projects related to pro-poor livestock issues and small-scale poultry-raising. Other livestock-related institutions such as ILRI should be approached.

Technical assistance grants to address key areas for further assessment and policy work should be prepared – based on priorities identified with partners – and should ideally draw on field-level case studies and IFAD project experience.

Establish a system for collecting and assessing experiences and lessons in microfinance and poultry-raising in order to identify lessons relevant to avian flu prevention and control. These should primarily be based on cross-country comparisons by IFAD and related experiences in Asia.

A contingency plan needs to be formulated for cases of human infection. The plan must identify mechanisms for ensuring the safety and effectiveness of project staff – stay calm, take hygienic precautions, minimize direct contact with poultry farms in the area – while at the same time maintaining all channels of veterinary and other project support.

Ideally with technical support from FAO and other international specialist agencies, establish more detailed procedures for animal health crises to provide guidance to regional contact persons and CPMs. These could cover: risk and impact assessments, regular reporting on crisis status, awareness and briefing materials, prioritizing and response to requests, and incorporating issues on zoonotic risks into PRSPs and livestock-related programmes.

Again primarily in partnership with FAO, but also with the World Bank, review regional and in-country experience to further develop policy guidance and capacity-building on zoonotic disease crisis vulnerability, rehabilitation and mitigation. This information could be used to further enhance COSOPs and any support activities at the country level that relate to dialogue on livestock development programmes in poverty reduction strategies. IFAD should adopt a strong advocacy role in highlighting the vulnerabilities and needs of poor poultry farmers.

Priority actions at regional and corporate levels
Priority actions are suggested in support of the regional- and corporate-level strategies (Box 3). With the present set of strategies having been identified though the initiative of the Asia and the Pacific Division, it is expected that these priority activities at regional and corporate levels would initially overlap to a considerable degree. Refinement of country responses would also need to be handled jointly initially at country, regional and corporate levels, for example replies to requests for country assistance (Box 2 will need further refinement based on initial experiences). The priorities include establishing an internal response system and initiating partnerships with ECTAD and other key entities to explore shared interests in the socio-economic issues of avian flu.
## Characteristics of poultry subsectors in Asia

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Industrial and integrated</th>
<th>Commercial poultry production</th>
<th>Village or backyard</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sector 1</td>
<td>Sector 2</td>
<td>Sector 3</td>
</tr>
<tr>
<td>Production systems</td>
<td>Fully integrated</td>
<td>Independence or part integrated</td>
<td>Smallholder</td>
</tr>
<tr>
<td>Range of poultry kept</td>
<td>&gt;10,000-200,000</td>
<td>10,000-1,000</td>
<td>1,000-50</td>
</tr>
<tr>
<td>Household or unit dependency on poultry</td>
<td>High</td>
<td>High</td>
<td>Very high</td>
</tr>
<tr>
<td>Biosecurity</td>
<td>High</td>
<td>Moderate-high</td>
<td>Low</td>
</tr>
<tr>
<td>Market outputs</td>
<td>Export and urban</td>
<td>Urban/rural</td>
<td>Live urban/rural</td>
</tr>
<tr>
<td>Dependence on market for inputs</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Dependence on good roads</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Location</td>
<td>Near capital and major cities</td>
<td>Near capital and major cities</td>
<td>Smaller towns and rural areas</td>
</tr>
<tr>
<td>Birds kept</td>
<td>Indoors</td>
<td>Indoors</td>
<td>Indoors/part-time outdoors</td>
</tr>
<tr>
<td>Contact with domestic birds and wildlife</td>
<td>None</td>
<td>None</td>
<td>Yes</td>
</tr>
<tr>
<td>Veterinary service</td>
<td>Own veterinarian</td>
<td>Pays for veterinary service</td>
<td>Pays for veterinary service</td>
</tr>
<tr>
<td>Source of medicine and vaccine</td>
<td>Market</td>
<td>Market</td>
<td>Market</td>
</tr>
<tr>
<td>Source of technical information</td>
<td>Company and associates</td>
<td>Sellers of inputs</td>
<td>Sellers of inputs</td>
</tr>
<tr>
<td>Source of finance</td>
<td>Banks and own</td>
<td>Banks and own</td>
<td>Banks and private</td>
</tr>
<tr>
<td>Breed of poultry</td>
<td>Commercial</td>
<td>Commercial</td>
<td>Commercial</td>
</tr>
<tr>
<td>Food security of owner</td>
<td>High</td>
<td>OK</td>
<td>OK</td>
</tr>
</tbody>
</table>

a Modified from Dolberg, Guerne-Bleich and McLeod (2005).
b Authors’ rough classification. In the Dolberg, Guerne-Bleich and McLeod (2005) study, different countries used slightly different classifications.
c May be informal moneylenders, relatives and friends.
Annex B

Area risk and relevance assessment for selected IFAD-supported loan project areas in selected Asian countries

Preliminary area risk (rice wetlands, high poultry density, human population density – see section I, subsection “Epidemiological patterns”) and component and target group relevance assessment (components: livestock or microfinance for rural women).


Numbers refer to approximate project locations on maps in Figure 1. Greater risk and relevance are shown by more asterisks (most ***) , with no or negligible risk or relevance shown by hyphen (-). Question mark (?) marks insufficient information to make assessment.

<table>
<thead>
<tr>
<th>Bangladesh</th>
<th>Area risk</th>
<th>Relevance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Aquaculture Development Project</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2 Smallholder Agricultural Improvement Project</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>3 Sunamganj Community-Based Resource Management Project</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>4 Microfinance and Technical Support Project</td>
<td>***</td>
<td>**</td>
</tr>
<tr>
<td>5 Microfinance for Marginal and Small Farmers Project</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Viet Nam</th>
<th>Area risk</th>
<th>Relevance</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 Ha Tinh Rural Development Project</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>7 Rural Income Diversification Project in Tuyen Quang Province</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>8 Decentralized Programme for Rural Poverty Reduction in Ha Giang and Quang Binh Provinces</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>9 Programme for Improving Market Participation of the Poor in Ha Tinh and Tra Vinh Provinces</td>
<td>***</td>
<td>**</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>China</th>
<th>Area risk</th>
<th>Relevance</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 Wulin Mountains Minority-Areas Development Project</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>11 Qinling Mountain Area Poverty-Alleviation Project</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>12 West Guangxi Poverty-Alleviation Project</td>
<td>**</td>
<td>**</td>
</tr>
<tr>
<td>13 Environment Conservation and Poverty-Reduction Programme in Ningxia and Shanxi</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>14 Rural Finance Sector Programme</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>15 South Gansu Poverty-Reduction Programme</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indonesia</th>
<th>Area risk</th>
<th>Relevance</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 P4K - Phase III</td>
<td>***</td>
<td>**</td>
</tr>
<tr>
<td>17 Post-Crisis Programme for Participatory Integrated Development in Rainfed Areas</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>18 East Kalimantan Local Communities Empowerment Programme</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
Assessment of likely impacts of avian influenza on rural poverty reduction in Asia

Figure 1
Poultry density and higher-risk areas for sources of avian influenza outbreaks in China and South-East Asia

a Approximate areas of IFAD-supported projects in Bangladesh, China, Indonesia and Viet Nam are indicated (see section V, subsection “Particular threats to IFAD-supported projects and beneficiaries”; numbers refer to projects listed in Annex B).
b All areas with a high density of poultry will be at higher potential risk for outbreaks.

Data sources: FAO Geonetwork online GIS (www.fao.org/geonetwork), Gilbert et al., 2008 and author interviews.
a Arrows show flow of live poultry between production systems and markets. Within backyard systems curved arrows indicate consumption. Substantial backyard production can also occur in peri-urban areas. There are considerable information uncertainties (indicated by question marks “?”) in the indicated onward sales from smaller rural markets to larger more urban markets, and in the effects of market regulations (red crosses). Figure based on hypothetical situation, but based on various sources of information and observations, largely from Vietnam.
Table 1
Macroeconomic and poultry-sector data in selected countries

<table>
<thead>
<tr>
<th></th>
<th>Viet Nam</th>
<th>China</th>
<th>Indonesia</th>
<th>Bangladesh</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP US$ million</td>
<td>33 202</td>
<td>1 208 854</td>
<td>224 386</td>
<td>53 759</td>
</tr>
<tr>
<td>Agricultural GDP US$ million</td>
<td>7 500</td>
<td>180 049</td>
<td>38 075</td>
<td>12 575</td>
</tr>
<tr>
<td>Livestock GDP US$ million</td>
<td>1 396</td>
<td>61 303</td>
<td>4 769</td>
<td>1 579</td>
</tr>
<tr>
<td>Human population – million</td>
<td>80</td>
<td>1 272</td>
<td>217</td>
<td>144</td>
</tr>
<tr>
<td>All poultry products, 1,000 tonnes (eggs only)</td>
<td>647 (227)</td>
<td>37 125 (24 627)</td>
<td>2 051 (946)</td>
<td>276 (161)</td>
</tr>
<tr>
<td>Milk* and egg production, 1,000 tonnes</td>
<td>57 337</td>
<td>41 565</td>
<td>1 731</td>
<td>2 415</td>
</tr>
<tr>
<td>Livestock meat, 1,000 tonnes</td>
<td>2 298</td>
<td>65 866</td>
<td>2 076</td>
<td>446</td>
</tr>
<tr>
<td>Poultry as % of livestock – meat only</td>
<td>18</td>
<td>19</td>
<td>53</td>
<td>26</td>
</tr>
<tr>
<td>Poultry as % of livestock – all livestock products</td>
<td>25</td>
<td>35</td>
<td>54</td>
<td>10</td>
</tr>
<tr>
<td>Poultry production kg/person/year  (rough estimate for consumption also)</td>
<td>8.1</td>
<td>29.2</td>
<td>9.5</td>
<td>1.9</td>
</tr>
<tr>
<td>Estimated total poultry GDP US$ million (based on % of livestock meat)</td>
<td>255</td>
<td>11 632</td>
<td>2 538</td>
<td>407</td>
</tr>
<tr>
<td>Estimated poultry GDP as % of total GDP</td>
<td>0.8</td>
<td>1.0</td>
<td>1.1</td>
<td>0.8</td>
</tr>
</tbody>
</table>

Source: FAO (2005c); Knips (2004).

*a Original data for milk and eggs are not disaggregated.

Table 2
Composition of household poultry-raising in selected countries

<table>
<thead>
<tr>
<th></th>
<th>Production share by backyard (smallholder) (%)</th>
<th>Share of poultry-raising households (%)</th>
<th>No of poultry households</th>
<th>% population very poor (&lt;$1 day)</th>
<th>% population poor (&lt;$2 day)</th>
<th>Likely number of poor households with poultry (very poor)</th>
<th>Number of poor people in households with poultry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cambodia</td>
<td>99.0</td>
<td>99.9</td>
<td>1.9</td>
<td>36.0</td>
<td>0.7 (0)</td>
<td>3.4 (0)</td>
<td></td>
</tr>
<tr>
<td>China</td>
<td>56.0</td>
<td>156.0*</td>
<td>5.0*</td>
<td>7.8 (0)</td>
<td>39.0 (0)</td>
<td>2.2 (0.8)</td>
<td></td>
</tr>
<tr>
<td>Indonesia</td>
<td>63.0</td>
<td>30.0</td>
<td>7.0</td>
<td>55.0</td>
<td>16.5 (2.1)</td>
<td>82.5 (10.5)</td>
<td></td>
</tr>
<tr>
<td>Lao People’s Dem. Rep.</td>
<td>90.0</td>
<td>0.6</td>
<td>26.0</td>
<td>73.0</td>
<td>0.4 (0.2)</td>
<td>2.2 (0.8)</td>
<td></td>
</tr>
<tr>
<td>Thailand</td>
<td>20.0</td>
<td>90.0</td>
<td>4.1</td>
<td>2.0</td>
<td>32.0</td>
<td>1.3 (0.1)</td>
<td>6.6 (0.4)</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>55.0 (6.0)</td>
<td>94.0</td>
<td>7.8</td>
<td>17.0</td>
<td>64.0</td>
<td>5.0 (1.3)</td>
<td>25.0 (6.6)</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>31.7 (158.0 (18.0))</td>
</tr>
</tbody>
</table>

*a Assuming 60 per cent of Chinese households raise backyard chickens.

b Assuming five people per family.

c Based on Government’s poverty line.
### Table 3
Possible direct and indirect costs and impacts of avian influenza

<table>
<thead>
<tr>
<th></th>
<th>Private sector</th>
<th>Government</th>
<th>Private sector</th>
<th>Government</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Direct</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Loss of poultry from disease</td>
<td>Control activities such as culling, disposal and enforcement of movement restrictions</td>
<td>Costs of upgrading biosecurity on farms</td>
<td>Establishing long term control measures and surveillance systems</td>
</tr>
<tr>
<td></td>
<td>Loss of income</td>
<td>Vaccination</td>
<td>Costs of changes in market standards</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Loss of food</td>
<td>Compensation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cost of disposal and cleaning farms</td>
<td>Extra surveillance</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Restocking</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Protests and conflict over control measures</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Indirect</strong></td>
<td>Loss of income to producers and traders due to drop in poultry prices</td>
<td>Additional coordination efforts</td>
<td>Identifying and allocating resources to alternative livelihoods</td>
<td>Establishing support programmes for producers who no longer depend on poultry</td>
</tr>
<tr>
<td></td>
<td>Loss of sales by input traders</td>
<td>Increased public information to address social unrest</td>
<td>With more commercial production, women and poorer households may lose out</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Loss of tourism</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Weaker social relations with loss of poultry for gifts and rituals</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


Assessment of likely impacts of avian influenza on rural poverty reduction in Asia

References

Institutional websites providing updates and information

AsDB avian flu site: www.adb.org/BirdFlu/adb.asp
FAO Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases (EMPRES), situation updates on avian flu outbreaks and country and international activities: www.fao.org/ag/AGA/AGAH/EMPRES/tadinfo/e_tadAVI.htm
Network for Smallholder Poultry Development website (Denmark): www.poultry.kvl.dk
World Bank avian flu site, including links to pipeline projects: www.worldbank.org/avianflu
World Health Organization (WHO) avian flu site: www.who.int/csr/disease/avian_influenza/en/
World Organization for Animal Health (OIE) avian flu site: www.oie.int/eng/AVIAN_INFLUENZA/pub.htm

Key references


Kirim, R., G. Stallkamp, S. de Pee, N. Akhter, A. Talukder and R. Moench-Pfanner (2005) *Integration of poultry raising with homestead food production plays an important role to ensure food security and improve child nutrition*, in *Does poultry reduce poverty and assure food security? – a need for rethinking the approaches*, proceedings of a workshop, University


IFAD
The International Fund for Agricultural Development (IFAD) is an international financial institution and a specialized agency of the United Nations dedicated to eradicating poverty and hunger in rural areas of developing countries. Through low-interest loans and grants, it develops and finances programmes and projects that enable poor rural people to overcome poverty themselves.

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