



United against bird flu

Reports from
the global campaign





Bird **flu** goes global

TIMELINE



2003

DECEMBER

- ▶ H5N1 bird flu virus first recognized in Republic of Korea.

2004

JANUARY

- ▶ Outbreaks in 10 countries across East and Southeast Asia, closing down regional markets for poultry and poultry products overnight. FAO Director-General Jacques Diouf appeals to donors for help, warning that only "a brief window of opportunity" exists to contain the disease.

FEBRUARY

- ▶ FAO provides US\$5.5 million from its own resources to Asian countries to fight bird flu.
- ▶ FAO-OIE-WHO hold emergency strategy meeting in Rome with experts from 14 countries.
- ▶ Officials, international experts, donors and development organizations from 23 Asia-Pacific countries meet in Bangkok for a regional emergency meeting.

MARCH

- ▶ In Asia, 23 people have died so far and 100 million poultry have died or been culled.

NOVEMBER

- ▶ FAO-OIE warn that domestic ducks may be acting as a silent reservoir for disease transmission (*See Cracking the mystery of how the disease spread, page 7*).

2005

FEBRUARY

- ▶ FAO-OIE-WHO organize regional meeting in Ho Chi Minh City. FAO warns that bird flu could lead to new global human influenza pandemic.
- ▶ Close to 140 million birds have died or been destroyed in Asian epidemic to date, leaving many farmers in deep debt. Cost to Asian farmers in 2004 estimated at US\$10 billion.
- ▶ FAO sends expert to DPR Korea, helping to contain bird flu outbreak there.

APRIL-JUNE

- ▶ In China, 6 000 migratory birds die from H5N1 virus.

JULY

- ▶ Russia and Kazakhstan confirm H5N1 outbreaks in poultry and wild birds.

AUGUST

- ▶ In Mongolia, about 90 migratory birds die of bird flu.
- ▶ FAO warns that Asian bird flu is likely to be carried over long distances along the flyways of wild water birds to the Middle East, Europe, South Asia and Africa.

SEPTEMBER

- ▶ UN System Coordinator for Avian and Human Influenza takes up residence at UN Headquarters.

OCTOBER

- ▶ Bird flu reaches Romania and Turkey through wild bird migration.

DECEMBER

- ▶ FAO estimates that the livelihoods of 200 million poor small-scale farmers have been seriously affected by the disease.



2006

JANUARY

- ▶ International Pledging Conference on Avian and Human Pandemic Influenza in Beijing, China commits US\$1.9 billion to fighting the disease.
- ▶ The World Bank estimates that a human influenza pandemic caused by a virus mutated from avian flu could cost the global economy US\$800 billion per year.

FEBRUARY

- ▶ Bird flu reaches Nigeria.
- ▶ In Europe, bird flu spreads quickly westward through wild birds (Italy, Greece, Switzerland).

APRIL

- ▶ Bird flu now confirmed in 45 countries on three continents.

MAY

- ▶ FAO-OIE host an international scientific conference on avian influenza and wild birds.



FAO'S ROLE IN CONFRONTING BIRD FLU

In the avian influenza crisis that began in Asia in late 2003 and has now spread to Europe and Africa, FAO's roles are many. The Organization provides policy advice, strategy design, technical information and guidelines, contingency planning and technical assistance, training, equipment and supplies such as laboratory equipment, vaccines, agency and donor coordination and public advocacy. It works hand-in-hand with the World Organisation for Animal Health (OIE) and, because of the threat to human health, the World Health Organization (WHO). It also works with UNICEF in grassroots communication. All UN agencies work under the umbrella of the UN System Coordinator for Avian and Human Influenza.

Appropriate, timely help

"FAO and OIE sent experts at the beginning of the outbreak to help us draw up an emergency plan," recalls Dr Bui Quang Anh, Director-General of the Department of Animal Health, Viet Nam. "We had never had this problem before."

Dr Anh says he benefited from an FAO-sponsored avian flu study trip to the Netherlands in 2003, after the disease had broken out in that country but before it erupted in Viet Nam.

In Nigeria in 2006, animal health authorities profited from experiences brought to their attention from distant Asia. "FAO plays a part in bringing advice from other continents," says Dr Junaidu Maina, Acting Director of the Federal Department of Livestock and Pest Control Services. "For example, they alerted us to the fact that we will need an 'exit strategy' to help some farmers hit by bird flu who will not return to chicken keeping." He praises FAO for its timely technical and policy advice and technical assistance such as training of 600 animal health technicians and the provision of protective clothing, disinfectant and lab materials.

FAO's global reach

As the epidemic went global, FAO's strengths as an international organization became evident: experienced multilingual staff, rosters

of international experts and offices in 90 countries. It has tried to keep ahead of the disease, preparing countries as far away as Latin America for possible outbreaks.

In the period from January 2004 to June 2006, FAO fielded a total of 392 missions to assist countries in confronting bird flu.

FAO plays a strong role in promoting regional cooperation as well.



In order to predict disease spread, Turkey needed help with regional information, according to Dr Musa Arik, head of Animal Health Services: "FAO helped us understand the bird flu situation in countries that border Turkey, something we could not always do on our own."

In West Africa, working with the African Union's Programme for the Control of Epizootics (PACE), FAO provided funding from its own resources to set up specific regional networks of laboratories and surveillance teams, and organized regional workshops on bird flu control, exchange of animal health personnel between countries and information sharing.

Finally, FAO has a broader role and comparative advantage in transboundary control for livestock diseases other than bird flu. Its Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases (EMPRES) was created in 1994 to prevent disease and pest outbreaks from getting out of control.

"Even before bird flu, we in PACE have been working on a surveillance network on rinderpest and African swine fever," says Ibrahim Ahmed, National Coordinator for PACE Nigeria. "FAO has helped us in updating preparedness plans and coordinating activities of donors."



Officials from UN agencies and the Vietnamese government meet in Hanoi to discuss bird flu issues. (FAO/H. D. Nam)

Below: Animal health authorities burn chicken carcasses in Kano, Nigeria in February 2006 to prevent the spread of bird flu. (FAO/P. Ekpei)

Funding for FAO's Avian Flu Programme [as of 6.2006]

Donor	US\$ millions*
United States of America	19.9
Japan	12.4
Sweden	10.0
FAO	9.2
Asian Development Bank	6.5
Germany	6.3
France	6.0
Switzerland	3.7
Norway	3.7
Italy	3.5
United Kingdom	3.0
Australia	2.3
Viet Nam Joint Programme	2.0
Saudi Arabia	1.0
Spain	0.48
Netherlands	0.48
New Zealand	0.34
UN Development Group Office	0.19
Jordan	0.05
UN Association Programme for Afghanistan	0.025
TOTAL	84.0

* Figures represent total funds received from each donor plus those agreed but not yet received.

Viet Nam fights back with sweeping **vaccination** campaign



MASSIVE
INFORMATION
EFFORT
CONVINCED
POULTRY
FARMERS



Main photo: Activities at a vaccination point in northern Viet Nam. (FAO/H. D. Nam)
Left: A woman arrives with chickens to be vaccinated. (FAO/H. D. Nam)

HANOI, Viet Nam – In 2004–2005, the bird flu virus was ravaging the country with outbreaks in nearly every region and millions of birds culled to contain the disease. Forty-two people contracted the virus and died. As authorities faced a growing threat to human health they took the decision in 2005 to vaccinate all of the country's 220 million chickens.

Today, the success of Viet Nam's vaccination campaign can be measured by the fact that in 2006, up until May, not one person died from H5N1, nor has there been a single outbreak among poultry.

According to Dr Hoang Van Nam, Deputy Director of Viet Nam's Department of Animal Health, the decision to vaccinate was not difficult. "If outbreaks are occurring literally everywhere, eradication is really not an option. So, as the

disease came in waves, we geared up at the end of the second wave and began vaccinating poultry before the arrival of the third wave."

Farmers enthusiastic

In rural northern Viet Nam in April, multitudes of backyard farmers could be seen on their scooters or trekking along village roads, carrying their chickens to be vaccinated.

In An Thuong village, north of Hanoi, District Veterinary Director Pham Cong Van explained, "We have 168 vaccination points in the district. By using posters and broadcast media we let people know where we will vaccinate and when and we make sure people are aware of the benefits of vaccination and the dangers of not getting their poultry vaccinated."

Nguyen Thi Binh, a backyard farmer in her 60s, arrived at the

vaccination point with 70 chickens and ducks, which she carried in two wicker baskets balanced by a pole over her shoulder. "My chickens and ducks are mainly food for the family, but I do sell a few of them. While there's never been a case of bird flu in this village, we want to make sure to keep it that way. I'm very happy with this service from the government, especially that it's free."

According to Dr Nam, "From the very beginning of the first bird flu outbreaks we got a lot of help from FAO, which recruited and funded a consultant with extensive experience about the H5N1 virus from the early years when it first surfaced in China and Hong Kong. They also gave us funding from their Technical Cooperation Programme, both before and during the vaccination campaign."

FAO also provided "cull boxes"

“If outbreaks are occurring literally everywhere, eradication is really not an option.”

Dr Hoang Van Nam - Deputy Director, Department of Animal Health



for the humane disposal of sick and exposed birds and protective clothing and gear for the vaccination teams. More recently, it provided Global Positioning System (GPS) devices, which show exact latitude and longitude, to help map and study outbreaks of the disease.

Campaign logistics

When the government began the campaign, animal health officials knew success would require a massive and coordinated effort.

“We had to train vaccinators and ensure the cold chain for the vaccine. We secured 280 million doses of vaccine from China to vaccinate 87 million chickens and 40 million ducks in the first round of vaccinations between October and December 2005,” said Dr Nam.

Dr Nguyen Dang Vang, Director, Department of Livestock Production, says, “More that 100 000 people

were mobilized for the vaccination campaign. I think our success can be attributed to the determination of Viet Nam’s leadership, dedication of local authorities and the information campaign, which was really critical to our efforts.”

According to Dr Nam, “The cost of the overall vaccination campaign is hard to estimate, because Viet Nam’s response has been so decentralized. In the north people bring their chickens to a central vaccination point, but in the south animal health workers must go house-to-house vaccinating. They are paid US\$3 a day plus a small amount for each bird vaccinated. This was funded by the United States Agency for International Development.”

To export poultry, a country must prove to export markets that it is free of any diseases and Dr Nam points out, “All that costs a lot, so there is no benefit for Viet Nam to increase production of poultry for export, especially since we cannot produce enough for our own domestic needs.”

Changes to Viet Nam’s poultry sector are on the way, driven by health concerns. The country is reorganizing poultry farming to ensure better biosecurity, animal health officials say. With FAO advice, options for restructuring are evaluated including assessment of the impact on poor farmers’ livelihoods, and policies to mitigate negative consequences.

Viet Nam has not sounded the all clear yet, but across the country

there is a sense of relief that the worst may be over. Poultry markets are still depressed and chicken smuggling across the border with China remains problematic, but continued vaccination and intense surveillance hold the promise of continued success. —



Left: Poultry consumption in Viet Nam has declined due to fear of contracting bird flu, although authorities continue to reassure consumers that well cooked chicken is safe to eat. (FAO/H. D. Nam)

Right: Public service posters promote good hygiene as a way to prevent bird flu transmission. (FAO/H. D. Nam)

Top, right: Dr Hoang Van Nam, right, Deputy Director of Viet Nam’s Department of Animal Health, describes the challenges of vaccinating 220 million chickens. (FAO/H. D. Nam)



THIRTEEN
MINISTRIES,
TWO MILLION
VOLUNTEERS
TOOK PART



Thailand shares **secrets** of success

BANGKOK, Thailand – These days, animal and human health officials, not to mention poultry farmers across the country, are breathing cautious sighs of relief as they dare to hope that the country may have successfully brought bird flu under control.

The battle has been long and hard and the losses great, including the death of 14 people from bird flu in 2004 and 2005. Millions of chickens, ducks and geese across the country of some 65 million people died of bird flu or were destroyed. When the disease swept across Thailand in 2004, more than half of the country's 76 provinces were affected. But, as of May 2006, there has not been a single human case of bird flu in Thailand for almost a year and no poultry cases for six months.

Dr Oraphan Pasavorakul, in the Bureau of Disease Control, explains how her country got to grips with avian influenza (AI): "As the first wave of AI hit Thailand in 2004, we turned to

FAO, OIE and WHO for guidance on ways to contain outbreaks we faced and they gave us strong guidance and support that has helped us get where we are today."

Speaking from the bird flu "war-room" in the Department of Livestock Development, Dr Pasavorakul says, "Gaining the upper hand over AI took the cooperation of many sectors in Thai society as well as assistance from international organizations like the FAO, OIE and WHO." Thirteen government ministries were involved in containment efforts, including the ministries of defence and the interior. The army and police were enlisted to help livestock officials cull infected areas and control the movement of animals, poultry products and people.

Farmers compensated

Today, the battle continues with the hope of wiping out the disease in commercial poultry within two years and in backyard poultry, other birds



Industrial poultry plants like this one in Thailand generate important export revenues and employ thousands of workers. (FAO/B. Ismoyo)

Top: An animal health worker disinfects a cargo of chickens at a roadside inspection station north of Bangkok. (FAO/B. Ismoyo)

Opposite page: A lab technician checks for the bird flu virus in Thailand. (FAO/B. Ismoyo)

“I’m happy with the new system ... fewer of my ducks die and I get a better price for my eggs.”

Kanchama Pratum - Farmer



and animals within three years. The strategy also aims to have no animal-to-human transmission by the end of 2007.

“The three most important steps we took to control AI,” says Dr Pasavorakul, “were intense and constant surveillance, we call it X-ray surveillance, fair compensation for culled birds, continuous poultry inspection and control of all poultry movement in the country.”

Thailand mounted an unprecedented campaign to bring H5N1 under control, fielding some two million volunteers to knock on every door in every village in search of sick poultry. Live poultry markets in the country are also monitored for birds with signs of illness.

Animal health authorities culled affected areas, paying farmers 75 percent of the local market price for their poultry. Affected areas were promptly disinfected and dead birds and infected materials were buried. Areas suspected of being infected were quarantined and the movement of poultry and animals was controlled within a 10-kilometre radius for 30 days.

Watching the roads

Travelling across Lopburi province north of Bangkok, large poultry-laden trucks can be seen stopped on the side of the road, for inspection, disinfection and sometimes quarantine. Surawut Sinseubpol, chief of the Lopburi animal quarantine station, says: “Surveillance and containment are the two main pillars to halt the spread of animal disease. At this station alone, we inspect the transportation of more than one million chickens a month.”

More than two years since the first major outbreaks, the cost of Thailand’s X-ray surveillance programme is looking like money well spent. Though no one dares to say the disease has been defeated, yet. 🇹🇭

Cracking the mystery of how the disease spread

SINGBURI, Thailand – When an FAO study, conducted in collaboration with the Thai government and released in 2005, suggested that ducks roaming newly harvested rice fields could be responsible for spreading the deadly H5N1 bird flu virus, Thailand took the news seriously and decided to make drastic changes in traditional duck farming.

Free-range duck farming has flourished alongside rice production in Thailand for centuries, to the mutual advantage of rice farmers and duck farmers. When a rice farmer finishes his harvest, he invites any neighbours who keep ducks to bring them over to “clean up” his field, feasting on newly exposed snails and insects. But ducks can carry the H5N1 virus and not show clinical signs. Farmers unwittingly spread the virus as they drove their ducks from field to field, the study found.

Therefore, Thai authorities opted to promote a move away from free-range to “closed duck farms”, in which the ducks are penned up. The decision could have been costly for poorer farmers, especially in areas where outbreaks of bird flu had occurred. However, capitalizing on the traditional Thai respect for authority and offering a generous compensation scheme, Thailand was able to encourage farmers to adopt the changes willingly.

Kanchama Pratum is typical of the first few free-range duck farmers to make the change.

“I never lost a single duck to bird flu, but my 1 500 ducks were killed in a cull because the disease broke out elsewhere in our province,” says Ms Pratum.

“Thanks to government compensation, I started over using the new closed duck farm system. I built new wooden duck pens and posts for the netting to cover the open areas myself with money from a soft loan provided by the government. I got plenty of technical advice from the Department of Livestock Development.”

“I’m happy with the new system, because there are some real advantages over free grazing. Though I have to pay for feed now, I find that fewer of my ducks die. On average I get a better price for my eggs than before.”



SUSPECTED
BIRD FLU
SAMPLES
OVERWHELMED
LABS

Turkey works to improve **response** time



ANKARA, Turkey – The speed at which bird flu spread through backyard poultry farms earlier this year so alarmed health authorities that Dr Musa Arik, Head of Animal Health Services in the General Directorate of Protection and Control, is now calling for an emergency fund to be set up with international help to tackle any future outbreaks of the disease. He is also advocating that Turkish laboratories be internationally certified to diagnose the deadly H5N1 bird flu virus in bird samples in order to speed up response time.

The last case of bird flu in Turkey was on 30 March 2006. Veterinarians are hopeful that the disease may be under control even as they continue surveillance of domestic and wild birds and encourage backyard farmers in more than 40 000 Turkish villages to improve hygiene and control access to their poultry coops.

Lessons to learn

FAO feels that Turkey's experience with bird flu holds lessons for countries that are presently free of the disease but which are preparing for its possible arrival.

As a country at the crossroads of Asia, Europe and Africa, Turkish authorities wonder what



part migratory birds played in introducing the disease: "The role of wild birds in spreading the avian influenza is still not clear, but we know that human activity plays a very important role in spreading the disease and this is activity we can do something about," says Dr Huseyin Sungur, Director General, Directorate of Protection and Control, Ministry of Agriculture and Rural Affairs.

When bird flu was confirmed in Turkey, authorities moved against high-risk areas and activities, shutting poultry markets and controlling the movement of birds.

However, Dr Arik explains that the country's response to bird flu was not without some unexpected difficulties. "At first sending specimens to the laboratories

worked well, but later many freight companies refused to carry the specimens and this became really critical over the long Bıram holiday, slowing efforts to identify the disease in a number of areas."

Many of the laboratories were overwhelmed with samples from dead birds, according to Dr Arik. "This is why I would like to see more reference labs certified to diagnose the disease, especially some of the local labs here in Turkey."

Compensation was another problem, he says. "Because we don't have any emergency fund for bird flu, the governorates tried to get funding wherever they could to compensate people for the birds that we had to cull during outbreaks of the disease. As a result, we know



“The governorates tried to get funding wherever they could to compensate people.”

Dr Musa Arik - Head, Animal Health Services

that compensation was somewhat uneven and we don't know the real cost of fighting bird flu.”

Impact on village life

In Bala, a town near Ankara, 90 percent of local people keep between three and five chickens, ducks or turkeys in their backyards. One bleak day in February 2006, after two chickens from the town were diagnosed with bird flu, authorities came and culled 1 229 chickens, 75 turkeys, 65 geese, 19 ducks and 16 pigeons.

Ayter Oztalp, who lost her birds, says, “Since my husband is a retired civil servant, we are still okay. The chickens were never a primary source of income. I just used the money to help with household expenses. You know, a little here, a little there.”

However, in the nearby village of Ahmetçayri, another outbreak claimed 360 chickens and 66 turkeys in a culling that set the women, who owned the poultry, against their husbands and brothers, who had called health authorities.

Village chief Necdet Polay explains: “When we heard that two of the chickens at Adna Okçu's house had died we immediately called the animal health authorities because we knew the dangers of bird flu from watching television. When the birds tested positive for H5N1, authorities collected all the poultry in the village and killed them.”

Mr Polay adds, “Our women were really angry with us for calling authorities. I even had to leave the village for a couple of weeks until things blew over.”



Representatives of UNICEF and FAO meet in Ankara to discuss the bird flu information campaign. (FAO/T. Tinazay)

Top: A farmer outside her chicken coop. (FAO/T. Tinazay)

Top, right: A merchant sells eggs, the cheapest form of animal protein. (FAO/T. Tinazay)

Opposite page: Keeping backyard poultry is popular in Turkey. (FAO/T. Tinazay)

UN partners hone art of grassroots communication

ANKARA, Turkey – When bird flu first broke out, FAO and UNICEF swung into action honing messages designed to save the lives of lower-income women and children, the people most likely to be raising poultry at home. FAO provided specialized knowledge about bird flu, while UNICEF contributed years of communication expertise gained through its grassroots programmes to improve children's health and education.

Promoting life-saving behaviour is not as simple as broadcasting a message or handing out a brochure. It is important that authorities have a unified message and know how to deliver that message to the people who most need it. Different styles and channels of communication may be needed to reach people in distant places, and those with different social and cultural backgrounds. Too many messages can result in confusion.

According to Sema Hosta, UNICEF's communication officer, “The only medium to reach all Turkish families is television. Often children will relay the messages they see on television to their parents who may not be watching. Some adults in remote areas of the country may not even understand Turkish all that well and in that case reaching them through their children becomes even more crucial.”

The communication programme works with government ministries on Turkey's Child Intersectoral Board, other relevant government ministries, the national broadcaster, the Turkish Red Crescent and non-governmental organizations.

Knocking the poor back down



BACKYARD POULTRY FARMERS LOSE LIVELIHOODS



Left: Pius Ilonah, outside his empty hen coop. (FAO/S. Nelson)

Top: The Ilonah family at home in Jos, Nigeria. (FAO/S. Nelson)

Opposite page: A good climate and industrious citizens made Jos the egg capital of Nigeria. (FAO/S. Nelson)

JOS, Nigeria – The road out of poverty is no longer straight and smooth for small-scale urban farmers in the egg capital of Nigeria.

Located on the cool Jos Plateau, this city has an ideal climate for poultry production, supporting 2 000 mostly small-scale producers, who ship eggs all over the country. But bird flu has torn through backyard hen houses, causing hardship among those who count on profits to feed their families, pay for education for their children or provide small pensions.

“I don’t know where it came from. All I know is that another farm in the area became infected and then mine. I lost 7 000 chickens,” says a dejected Pius Ilonah, 52. “Since then, friends have been donating food and some money to my family. We don’t have any savings or any other source of income and are just managing.”

Two of his children are in high

school and two in university, well on their way to good jobs and a better life. Now, the dream may be over.

“We are waiting for the government to give us whatever they will give us so we can restart,” he says. “I would borrow money but the bank wants my land as collateral. I need 1 000 layers as a starting point, which would cost 800 000 naira (US\$ 6 000). That’s a lot of money. Who is going to lend me that?”

Government veterinarians explain another problem that small-scale egg farmers like Mr Ilonah are going to have resuming production. Encouraged by the government in the 1970s, thousands of urban Nigerians started small backyard poultry businesses as a way out of poverty. Whole residential neighbourhoods built rudimentary hen coops, often cutting corners on bird health, hygiene and biosecurity. When a livestock disease as virulent as the

H5N1 avian flu virus arrived, it was a disaster waiting to happen.

“You can see his coops don’t have proper ventilation. And this neighbourhood has too many backyard operations. It is too crowded for good animal health,” says veterinarian Dr Ezek Pam. “In order to be recertified, he’ll have to move.”

Good farm practice

In an industrial park on the outskirts of the city, Sherifat Sheriff runs a model poultry farm with 5 000 laying chickens in clean, well ventilated facilities located in a large compound behind high walls. The hen houses are screened so no wild birds can enter. Her 10 farm labourers wear face masks, and overalls that they must remove whenever they go off site. Only visitors on business may enter – before family members would come and go – and they must dip their shoes in disinfectant at the gate

to prevent the virus being tracked in.

“Since I started my business in 1993 I’ve been very careful and haven’t been wiped out by any disease,” says Ms Sheriff. She explains that, unlike for the Ilonahs, egg farming is only one economic activity for her family. Her husband is an engineer, and one of their children is in university overseas, the others in elite local high schools.

Fears are being expressed that the bird flu crisis, not only in Nigeria but all over the world, will force poor small-scale producers out of business, with large-scale producers taking up the slack.

State of play

As of April 2006, 750 000 poultry had died of bird flu or been culled in Nigeria out of a total poultry population of 140 million. So far, animal health authorities have depended on a compensation scheme for affected farmers to encourage reporting of outbreaks, then cleaning out the affected area. An extensive public communication campaign advises producers on how to protect their flocks. 🇳🇬



“We don’t have any savings or any other source of income and are just managing.”

Pius Ilonah - Farmer wiped out by bird flu

When bird flu hits the poorest

GALLAYA RIGA, Niger – “Eggs and chickens are to sell, not to eat, and we buy grain with the money.”

Nana Aicha, a village homemaker, is explaining the facts of life. Even though the puny village children could obviously use some protein, eggs and poultry are too precious to eat. They are transported in cages across the border by ox cart to sell to waiting Nigerian traders.

One day in February 2006, villagers brought back something besides cash – the bird flu virus. Authorities think that the traders had the virus on their clothes or vehicles – the disease had already broken out in Nigeria – and passed it to the poultry. Villagers returned across the arid landscape to Niger in the evening with some unsold and now infected birds, spreading the virus to border villages and towns.

The effect was devastating and illustrates what would happen to poorer parts of Africa if the deadly disease spreads across the continent.

“We lost everything, because our chickens and ducks died overnight or because the government came and killed them,” says Ms Aicha. “We have a few goats and cattle we can sell in an emergency, but mostly we grow millet and sorghum, and depend on poultry for cash. With the cash we buy grain for our daily diet.”

“Today I’ll feed my five children and myself on millet, rice and some milk, salt and chillies,” she says.

Ali Abdu, the village chief, seems surprised when asked if the villagers eat fruit and vegetables. “We can go six months without even eating meat,” he says.



A woman in a border village in Niger stands beside her empty chicken shelter after the bird flu virus swept through the area. (FAO/S. Nelson)



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Back cover photo: A veterinary inspector in Thailand stops a truck transporting poultry as the country works hard to contain the bird flu epidemic. (FAO/B. Ismoyo)

Cover photo: A Vietnamese farmer brings his chickens to be vaccinated against bird flu. (FAO/H. D. Nam)