

## Characteristics and dynamics of backyard poultry systems in five Asian countries in relation to reduce and manage avian influenza risks

### Policy brief on issues related to small scale (back yard) production obtained from APEIR studies

- Small scale (back yard) production of poultry still represents an important source of income, nutritional security and social capital for many families in East and South East Asia. It remains important to assess the effects of any disease control and preventive measures on backyard poultry producers and poverty reduction before they are implemented.
- Even if government policy and economic development lead to a shift towards intensive poultry production, as is occurring in much of Asia, there will still be millions of families, and especially women, reliant on backyard poultry for livelihoods and income diversity. Support for this sector by agricultural and veterinary authorities should be maintained and strengthened. This support provides advantages to all production sectors given disease outbreaks in the backyard sector can still affect the intensive commercial sector, either through market losses or as a source of virus for onward transmission of disease.
- Support for smallholders can be channelled through local women's unions or establishment of producer groups
- Considerable training has already been provided to community-based animal health workers/veterinary paraprofessionals over the past 6 years and this should continue with a greater focus on training of more women for these roles and on practical measures for disease prevention.
- Women continue to play a much greater role in rearing of backyard poultry than men and any programs or activities that relate to or affect backyard production must take this into account.
- The production systems used by backyard producers cannot be made 'biosecure' in the same sense as commercial farms. This difference needs to be recognised and any measures developed to reduce risks associated with backyard poultry must be simple, affordable and consistent with existing production and feeding methods. Implementing changes is compounded by the fact that not all backyard farmers see avian influenza as a major concern. An Ecohealth approach involving all parties and examining all aspects of the issue is required when dealing with this issue.
- Results from interventions in villages in Vietnam indicate that significant behavioural change that reduce the risk to human health from avian influenza can be achieved through appropriate education. The experiences from these interventions should be assessed for applicability elsewhere in Vietnam and in other countries. School-based training appears to have been successful as well.
- Fewer pigs and poultry are kept together at village level than in the past as a result of the shift towards intensive production of pigs. This has reduced the risk of emergence of a novel pandemic influenza virus at the village level through the putative poultry-pig-human cycle. This finding along with emergence in 2009 of a novel swine-derived pandemic influenza virus justify a gradual shift in the focus for studies on emergence of new potential pandemic influenza viruses to intensive farms while maintaining a watch on village level production given the risk there has not been eliminated.
- Any attempts to standardise control and preventive measures for avian influenza regionally must take into account the many differences between countries in production systems and reasons for rearing small numbers of poultry. A 'one size fits all approach' is not appropriate.
- Coverage of mass vaccination programs for disease prevention in poultry will fall over time especially if farmers do not see the disease concerned as a risk. Reduced uptake needs to be factored in to long term planning of vaccination programs and assessments of vaccine effectiveness.
- Traders represent a major risk factor for disease transmission and appropriate ways to reduce the risk they pose should be explored further.

## 1. Brief summary of what was known prior to the project about backyard poultry production systems

From the 1970s onwards when the role of domestic ducks in the carriage of a wide range of avian influenza viruses and the potential role of pigs as mixing vessels for influenza viruses became apparent, village level production systems were considered to be important in the genesis of human pandemic influenza viruses. Southern China, with its close associations between humans, terrestrial poultry, pigs and domestic waterfowl, was proposed as an epicentre for their emergence (Shortridge and Stuart-Harris 1982).

Prior to the outbreaks of highly pathogenic avian influenza caused by viruses of the H5N1 subtype (H5N1 HPAI) in 2003-04 most public sector agricultural agencies focused their attention on the commercial poultry sector. In most countries less was known about the importance and structure of the backyard sector. A number of non-governmental organisation and donors recognised the very important role that backyard poultry could play in improving livelihoods, especially for women. DANIDA and other agencies had funded a number of projects aimed at supporting smallholder production. BRAC in Bangladesh and elsewhere had been an active supporter of smallholder poultry production (Dolberg 2007). Studies of local poultry production systems had also been undertaken in South East Asia (e.g. Tung 2005).

When H5N1 HPAI emerged as a regional problem in 2003-04, most countries gave little consideration to the effects on backyard producers of control measures such as wide area culling and restrictions on access to certain markets (such as closures of live poultry markets in major urban centres). Following the spread of H5N1 HPAI through Asia, one paper that looked at the effects of the disease and control measures in multiple South East Asian countries included some notes on smallholders (Rushton et al 2005). The DFID sponsored pro-poor livestock group commenced a series of studies on the effects of market changes and avian influenza policies on the rural poor and also provided information on the nature of the industry (see, for example, Maltsoglou and Rapsomanikis 2005).

In addition, a number of studies were commissioned to examine the effects of H5N1 HPAI and the policies and practices introduced to control the disease in individual countries such as projects in Vietnam that included information on the effect of these measures on small scale producers (ACI 2006, 2007). The importance of this sector was recognised in decisions to introduce vaccination for smallholder and backyard poultry in Vietnam and China, with the decision in the former, in part, based on the fact that most human cases had occurred at village level, not in association with larger commercial farms.

Some work had been conducted on compensation and its effects on disease reporting including a multiagency report issued in 2006 ((World Bank 2006). It was already evident that compensation did not cover the full cost of destroyed poultry in most jurisdictions or the cost of consequential losses. Under-reporting was known to occur even in places where appropriate compensation was available,

including cases in Hong Kong and Japan (Sims 2007), demonstrating that availability of compensation was not the full answer to enhanced disease reporting. In addition, compensation as an incentive for disease reporting was recognised as being of little value for species such as domestic ducks in which infection does not necessarily result in clinical disease.

The expansion of community-based animal health worker networks, which had occurred prior to the outbreaks of H5N1 HPAI was given greater impetus after the disease emerged and provided some pathways for improving disease reporting and, potentially, for provision of information on disease. However, their activities and training focussed mainly on management of specific diseases and outbreaks rather than preventive measures such as improvements to farm biosecurity measures.

The backyard poultry project was developed at a time when there was still considerable debate about the relative contribution of smallholder and village level poultry to the persistence and transmission of H5N1 HPAI and the effects of this disease and the control measures on households rearing the birds. No large scale studies had looked at and compared the effects and issues between countries. The international technical meeting on avian influenza held in Rome in June 2007 concluded that better information in this area was required based on comprehensive baseline research to allow vulnerable groups to be identified and protected and that regional networks of socio-economists, farming system and biodiversity specialists should be strengthened (FAO 2007).

## 2. Main findings from APEIR activities

The project, involving teams from China, Thailand, Cambodia, Indonesia and Vietnam, gathered and shared comprehensive data on the characteristics of smallholder and backyard producers, including information on the way they rear and market their birds, covering changes that took place since H5N1 HPAI emerged. It allowed comparisons to be made between the five countries in which the studies were undertaken.

The studies found marked differences in the nature of backyard poultry production between countries (e.g. Thailand where backyard poultry are kept mainly for social reasons, not for income) and also within countries (e.g. differences between Northern provinces (Ningxia and Shanxi) where backyard flocks were larger than those in Southern provinces (Hunan and Yunnan) in China).

Even though changes are occurring in the poultry sector across the region with a shift towards intensive production, the study found that the backyard sector is still very important (even if the number of birds reared has not yet returned to levels before H5N1 HPAI emerged as a regional problem) with many village level households rearing poultry to provide income (especially for women) and also providing high quality nutrients for children. Studies in Vietnam found a larger contribution of small scale and backyard poultry production to household incomes than those reported in other studies conducted prior to or at about the same time as this study, including studies conducted by the official statistician (ACI 2007). Households in the communes studied in Vietnam earned between 7.9% and 17.6% of their

income from poultry. In poor households any loss of income of this magnitude would have a major effect on livelihoods.

The study found that most backyard farmers do not implement measures recommended for improving biosecurity related to confinement of poultry, in part because they do not regard avian influenza as a significant risk and also because the measures proposed are not in line with existing production systems that rely on scavenging for food. One exception was the willingness of farmers in Vietnam to build shelters for their poultry using local materials that kept the cost of construction low (although they continued to allow free grazing of their birds during the day because of the nature of the production system after interventions).

The study also found that knowledge about avian influenza was generally good (albeit with some gaps in some countries that were addressed by interventions in all five countries) but the public awareness messages have not always resulted in long term changes to behaviour. It reinforced earlier findings that disease reporting by backyard farmers remains weak. Risky behaviour associated with dumping poultry carcasses and eating or selling dead poultry still occurred in a number of countries. Improved compensation (faster processing and higher rates) was proposed as one way to improve reporting and may have some effect (as the work from China suggested) although it is not clear whether this would solve the issue of under-reporting especially when farmers see other negative consequences associated with reporting. It was also established that information arising from disease reports in the field can be filtered at multiple levels in the veterinary services adding to the problem of underreporting of disease by farmers. These findings have implications for the efficacy of control measures that rely on early detection of all infected poultry, in particular stamping out. Veterinary administration at lower levels in China was still weak and proposed reforms had not been completed at the time the study was conducted. Elsewhere considerable training of community-based animal health workers has been conducted but further refinement is needed to shift the emphasis of work and training towards disease prevention.

Local township markets and other local farmers remain an important source of replacement poultry with greater risks of introduction of pathogens associated with these practices compared with direct purchase from well-managed hatcheries. A shift towards purchase of chicks from local hatcheries was seen in project villages in Vietnam following interventions although this was not the case for ducklings. In Vietnam there was a gradual reduction in uptake of avian influenza vaccine over time, a result that was in line with expectations when the vaccination campaign commenced, and correlates with the low risk perception for this disease.

Much of the sale of poultry occurs at the farm gate to traders who obtain poultry from multiple sources. Some traders then keep and feed the birds before on-selling to other traders or markets. Trader vehicles carrying poultry from different places also represent a potential risk. Aggregation of poultry from different sources represents a potential high risk point in market chains because it provides an opportunity for

poultry to get infected after leaving the farm of origin. This practice may help to explain some of the samples positive for H5N1 HPAI virus detected in poultry in markets in official disease surveillance programs in Vietnam and China and should be investigated further.

In the households studied in China, with the exception of those in Yunnan, few reported raising both pigs and chickens together which represents a major change from practices 20 years ago. In most areas backyard flocks were located close together but some distance away from large commercial flocks.

Poultry reared in backyard flocks is used for both home consumption and sale with marked variation within and between countries in the proportion sold. The study also reinforced previous findings of the importance of poultry for social purposes (feasts and gifts). If only the value of sales of poultry is considered in economic analyses then this underestimates the true value of backyard production.

Most farmers regard HPAI as a low to very low risk, except in places where severe outbreaks have occurred such as Ningxia in China (where large numbers of poultry were destroyed). Many backyard poultry farmers in China did not know that virus could be transmitted from poultry to human beings or the serious consequence of human infection by an H5N1 influenza virus. In Thailand it was found that many did not realise that movement of live poultry was a high risk practice for spreading the disease.

Interventions were mainly aimed at increasing knowledge about the disease and of biosecurity measures but behavioural change following the changes varied between countries. Some marked improvements were recorded in Vietnam across a number of areas that would reduce the likelihood of transmission of disease to poultry and from poultry to humans, including better personal hygiene. In other areas such as keeping different types of poultry separate, cleaning of pens and keeping poultry in fenced areas few changes were evident. Attempts to introduce more biosecure production and marketing practices in Cambodia, including a 'trade corner' in villages, managed by a community-based animal health worker, were less successful.

### 3. Capacity building

The major areas where capacity was built through the APEIR network included the following:

- Building and managing of transdisciplinary teams and building relationships with local authorities and village representatives
- Post-graduate training and qualifications for a number of students
- Experience in collecting and analysing complex information from diverse sources, including focus group discussions
- Better understanding of disease control and prevention at village level, including school students
- Understanding constraints in conducting applied research (e.g. examples from Cambodia) and the need to spend considerable time in the village to match local farming activities.
- Development of links with researchers in other countries allowing discussion of common issues



and gaining an understanding of similarities and differences between production systems and market chains

- Training of villagers in basic biosecurity and poultry husbandry

[http://siteresources.worldbank.org/INTARD/Re-sources/HPAI\\_Compensation\\_Final.pdf](http://siteresources.worldbank.org/INTARD/Re-sources/HPAI_Compensation_Final.pdf)

#### 4. Policy advocacy

Each of the teams engaged local officials when conducting initial surveys and interviews and involved them in subsequent interventions. This provided local officials with firsthand experience and knowledge of the issues facing backyard producers. The information gained from the project was provided to local, provincial and national authorities.

The following section contains information on the key messages that should be provided to policy makers from this work, distilled from the findings of the country studies.

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