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# Poverty, Livelihoods and HPAI – A Review

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## **Preface**

Since its re-emergence, HPAI H5N1 has attracted considerable public and media attention because the viruses involved have been shown to be capable of producing fatal disease in humans. While there is fear that the virus may mutate into a strain capable of sustained human-to-human transmission, the greatest impact to date has been on the highly diverse poultry industries in affected countries. In response to this, HPAI control measures have so far focused on implementing prevention and eradication measures in poultry populations, with more than 175 million birds culled in Southeast Asia alone.

Until now, significantly less emphasis has been placed on assessing the efficacy of risk reduction measures, including their effects on the livelihoods of smallholder farmers and their families. In order to improve local and global capacity for evidence-based decision making on the control of HPAI (and other diseases with epidemic potential), which inevitably has major social and economic impacts, the UK Department for International Development (DFID) has agreed to fund a collaborative, multi-disciplinary HPAI research project for Southeast Asia and Africa.

The specific purpose of the project is to aid decision makers in developing evidence-based, pro-poor HPAI control measures at national and international levels. These control measures should not only be cost-effective and efficient in reducing disease risk, but also protect and enhance livelihoods, particularly those of smallholder producers in developing countries, who are and will remain the majority of livestock producers in these countries for some time to come.

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## **Keywords**

HPAI, Poverty, Livelihoods, Gender, Poultry Production, Small-Scale Stakeholders, Smallholders.

## **More information**

For more information about the project please refer to [www.hpai-research.net](http://www.hpai-research.net).



## Executive Summary

The specific purpose of the DFID-funded Pro-Poor HPAI Risk Reduction Project is to promote evidence-based, pro-poor HPAI control measures at national and international levels. With that aim in mind, this review has three main objectives: (i) to extract information relating to poverty and livelihoods from a selection of literature on HPAI impact; (ii) to identify gaps in this information; (iii) and to summarise messages that emerge from the literature around pro-poor HPAI risk reduction policies.

Amongst smallholders in the poultry sector, three main groups emerge from the literature as those whose livelihoods are most vulnerable to the direct and indirect impact of HPAI, and these are: (i) traditional extensive producers for whom poultry provides household protein consumption and a quick source of cash; (ii) poor semi-commercial producers who have invested all or most of their assets in a small-scale poultry enterprise; and (iii) poor stakeholders in the poultry value chain, such as traders, input sellers, slaughterers, whose incomes are vulnerable to shocks in the poultry sector.

Further research around HPAI, livelihoods and poverty will help inform the design of HPAI-related policies so that they reduce risk whilst at the same time targeting poor smallholders with relevant development assistance. This future research should focus on poverty rather than production sectors, and have rigorous gender analysis.

The following gaps which have been identified in this review should also be addressed: HPAI impact on small-scale stakeholders in the poultry value chain (as opposed to just producers); difference between long and short-term impact on the poor; significance of location of poor households; attitudes of poor producers towards risk reduction strategies; impact of, and access to direct and indirect compensation strategies for the poor; likely impact of sector restructuring on the poor; and participation of the smallholder poultry sector in the design of risk reduction policies and programmes.

Pro-poor messages around risk reduction that have emerged from the reviewed literature can be clustered around the following themes: (a) poverty and gender targeting; (b) emergency short-term assistance, such as compensation; (c) long-term development assistance such as micro-credit, extension, diversification; and (d) communication and awareness raising around HPAI that takes into account the local context.

This review should assist policymakers in taking forward some of the information presented herewith in the form of pro-poor policy formulation and implementation.



## Introduction

### Background

Small-scale poultry production represents an important asset for the poor, even if insignificant in terms of income. It is a low-cost, low-investment system, contributes towards household protein and micro-nutrient consumption, and provides an income, or a quick source of cash to meet household needs. Amongst traditional extensive producers, poultry ownership is part of a diversity of assets that contribute towards complex livelihood strategies. They are managed by the poor to achieve food- and income-security. Amongst poor semi-intensive producers, poultry can represent their main livelihood asset, removal of which would leave a household vulnerable to deeper poverty. Finally, poultry is an important livelihood source for many other stakeholders in the poultry value chain, such as traders, slaughterers, market sellers, and transporters.

HPAI outbreaks have led to a string of short-term emergency control measures, such as drastic culling, and restrictions on the production, slaughtering, movement and marketing of poultry. They have also led to the design of longer-term prevention and control strategies, which include formulation or acceleration of sector re-structuring plans. These measures are taken in the interests of improving the bio-safety of poultry production, and thus reducing the risk of human and poultry deaths from HPAI. However, one inevitable by-product of these measures is that they favour the industrial poultry sector over the small-scale traditional or semi-industrial sectors, which are the focus of this paper.

Considerable research has been carried out into the impact of HPAI and control measures on different populations in affected countries. These include studies to assess the economic impact on animal health and poultry production, as well as studies to assess market impact. Most of these use the four production sectors classified by FAO as their central units of analysis. These sectors are:

- sector 1 – industrial;
- sector 2 – independent commercial;
- sector 3 – smallholder commercial;
- sector 4 – backyard systems<sup>1</sup>.

Not so well reported is the impact of HPAI and short and long-term prevention and control policies on those poor small-scale stakeholders in the poultry sector whose livelihoods depend on poultry (amongst other assets) for income and food security. This would complement economic and market analyses by assessing HPAI impact on the livelihoods of the poor up and down the poultry value chain. It would help policy makers manage the risk of HPAI infection, as well as inform livestock service providers, and development practitioners on appropriate mitigation and assistance measures for the poor. A recent FAO paper sets out the need for using a livelihoods perspective to manage the risk of HPAI and to assist the poor who are vulnerable to its impacts. It argues that livelihoods analysis is important because short-term impact differs according to socio-economic status, gender, location, as well as features of a poultry production system. Long-term sector adjustments will have differing effects on local livelihoods depending on their assets and the role of poultry in their livelihood strategies and outcomes, as well as underlying drivers that shape the poultry sector<sup>2</sup>.

In recognition of this identified need for a livelihoods perspective, the UK Department for International Development (DFID) has initiated a collaborative research project on pro-poor HPAI risk

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<sup>1</sup> When sectors 1, 2, 3 or 4 are referred to in this paper, they refer to this FAO classification.

<sup>2</sup> FAO/LSP: *Highly Pathogenic Avian Influenza and Sustainable Livelihoods (HPAI): Managing Risk and Developing Options*, 2008

reduction. The aim is to assist governments in controlling HPAI in a manner that minimizes the negative impact on different poultry producers and other stakeholders in the value chain, particularly the poor and those vulnerable to HPAI shocks. As part of this project, further research will be commissioned to assess HPAI impact on the livelihoods of the poor. A set of guidelines and tools are soon to be published by FAO that will assist researchers in analysing HPAI through a livelihoods lens. The first output of this work has taken a sustainable livelihoods framework initially designed by DFID, and adapted it to the HPAI context. According to this DFID livelihoods framework, people draw on a combination of assets to pursue a variety of livelihood outcomes. Access to assets and the strategies people employ are influenced by the vulnerability context and the prevailing institutional environment, as well as peoples' own preferences and needs. In the context of HPAI, poor households will devise risk management and coping strategies, by drawing on their livelihood assets, to minimise the threat of HPAI. Their livelihoods become vulnerable when they are unable to recover from the direct or indirect shocks associated with HPAI and control measures, and they fall deeper into poverty. Ultimately, successful poverty reduction policies are the ones who will raise people out of abject poverty.

### Objectives

As part of the process described above, this review has three objectives: (i) to extract information relating to poverty and livelihoods from a selection of published and unpublished literature on HPAI impact<sup>3</sup>; (ii) to identify gaps in this information; and (iii) to summarise messages that emerge from the literature around pro-poor HPAI risk-reduction strategies. In this way, it will contribute towards future livelihoods-related research, as well as inform relevant decision-makers about livelihoods and poverty considerations that should be addressed in sector development, policy formulation and assistance programming. For the sake of consistency, the extracted livelihoods and poverty-related information has been arranged around the same livelihoods framework as that designed in the ongoing FAO work mentioned in *section 1.1* above. *Annex 1* reproduces and adapts a diagram from this work that describes the adoption of the livelihoods framework to suit an HPAI context.

The aim is not to paint a complete picture around livelihoods, poverty and HPAI, which would be impossible for three reasons:

- Only a few HPAI impact assessments have so far been written from a livelihoods perspective; the intention of most authors was not to generate livelihoods-related results;
- HPAI impact assessments vary in their central focus of research (size of producer farm, level of biosecurity, markets); in their depth of analysis (primary or secondary sources) and in their coverage (national, provincial or village level);
- Livelihoods-related impact studies may be buried in literature that was not reviewed. Also, some may be ongoing<sup>4</sup>.

In Asia and North Africa, the reviewed literature covers: Viet Nam; Cambodia; Lao; Indonesia; Thailand<sup>5</sup>, Turkey and Egypt. In Africa it has covered Nigeria and Ethiopia, (in the case of Ethiopia the impact assessment is speculative). *Annex 2* provides a list of all documents reviewed, together with comments on their relevance to livelihoods and poverty-related analysis.

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<sup>3</sup> Criteria for selection of literature was availability at the time of writing this paper.

<sup>4</sup> For example, a PHD study is currently in progress in the UK, from the University of Cambridge, Department of Land Economy, Environmental Economy and Policy on *Impacts of HPAI and HPAI mitigation strategies of livelihoods, intra-household dynamics and household food and nutrition security in Nigeria*. This uses a livelihoods framework.

<sup>5</sup> Very little was found from Thailand relating to HPAI and poverty and/or livelihoods, which is why it is hardly mentioned at all in this paper.

In summary, the processes that lead to this paper followed a framework that asked three key questions for each country reviewed:

- What can be found in the literature on HPAI impact that relates to livelihoods and poverty?
- What else do we need to know relating to HPAI impact, livelihoods and poverty?
- What messages can be extracted from the information to inform policymakers about pro-poor HPAI risk-reduction strategies?

## **Poverty and Livelihoods Analysis in HPAI Impact Studies: Summary of Literature Using a Livelihoods Framework**

### **Which Groups are Most Vulnerable to HPAI and Control?**

Three groups emerge as those whose livelihoods are most vulnerable to HPAI and control: traditional extensive producers; semi-intensive producers; and other small-scale stakeholders in the poultry value chain other than producers.

#### *Traditional Extensive Producers*

These producers commonly practise low-input low-cost poultry production. They keep a handful of birds – normally local breed chickens - for home consumption and quick cash through local sales. They operate scavenging and semi-scavenging systems which are not biosecure, although are they not necessarily high-risk either. They lack financial capital to invest in inputs such as feed, or biosecurity measures to minimise HPAI risk. They lack knowledge about HPAI and seldom attend training courses or access extension services. The diverse livelihoods of those backyard producers who are poor or very poor are vulnerable to HPAI related shocks. According to FAO's four-sector classification, they correspond most closely to "Sector 4".

#### *Semi-intensive Producers*

These producers practise more intensive poultry production, chiefly for sale through local and more formalised markets, but also for home consumption. Their poultry flocks also mainly constitute local breeds, but they may have imported breeds as well. They have more knowledge about HPAI than backyard producers, but their systems are relatively poor in biosecurity, ranging from semi-scavenging to partial use of modern technology. Importantly, and unlike backyard producers, they have invested most or all of their capital in poultry production, so they have little or no safety net in the event of income loss from the impacts of HPAI. They are also typically poor or medium-poor. They would correspond most closely to FAO's "Sector 3".

#### *Small-Scale Stakeholders in the Poultry Value Chain other than Producers*

This group includes small-scale traders, market operators, slaughterers, transporters, and other stakeholders in the poultry market chain. They have also invested most or all of their capital in their business, and are vulnerable to the indirect effects of HPAI, such as price fluctuations, or restrictions and bans imposed across the poultry market chain. HPAI-related impact on the livelihoods on this group is least reported in the literature.

### **Wider Institutional Context**

Anticipated sector restructuring in some countries (such as Viet Nam, Indonesia) favours large-scale industrial poultry production with concentrated markets and fewer producers.

Technical and medical assistance, mainly in the form of extension and vaccination services, are often found to be weak with insufficient coverage, for example in Egypt, Viet Nam, and Cambodia. They are particularly inaccessible to small-scale farmers and those living in rural areas with poor

infrastructure. Research in Viet Nam found few training courses directed towards “Sectors 3 and 4” producers, and those that do exist are normally attended by producers from “Sectors 1 and 2”.

#### *Prevention and Control Measures*

Prevention and control measures in all affected countries include: culling; surveillance; movement control; slaughtering restrictions; import bans; communication strategies; imposition of biosecurity measures. Other measures imposed in some countries include: compulsory or optional vaccination; and poultry production bans.

#### *Mitigation Measures*

Key mitigation measures include: compensation; re-stocking schemes; micro-credit schemes; and low-interest loans to poor farmers. Where compensation measures exist, they have sometimes been dogged by complaints such as: low levels of payment, limited and slow disbursement and complicated processes (Viet Nam); unofficial provincial-level compensation schemes which created confusion (Cambodia); corruption (Egypt); and schemes which are slanted against the poor (Nigeria). Other than these, there is little information in the literature reviewed relating to the effectiveness of mitigation schemes.

### **Vulnerabilities**

HPAI-related shocks either cause direct impacts, through human and poultry deaths, or indirect impacts, through policies and processes such as those ones described above.

Semi-intensive producers are vulnerable to the direct impact of poultry deaths from disease or culling as they have heavily invested their capital in poultry. Backyard producers, on the other hand, who regard as normal high numbers of their poultry dying from disease, do not see the need to report every death. In Cambodia, for example, some farmers considered poultry deaths during the hot season as completely normal. These producers, who operate low-cost/low-investment systems, generally ignore disease prevention strategies, and seldom seek veterinary assistance or vaccination. They have devised coping strategies to mitigate against regular poultry deaths that prevent them from tipping over into food or income insecurity.

Poultry production bans tend to be imposed in urban areas following an HPAI outbreak. For example, in Viet Nam there was a production ban in 15 urban areas, and poultry production for consumption or sale was banned in all residential areas of Jakarta Province in Indonesia. Both these bans affected small-scale urban producers and input suppliers, many of whom were forced to seek alternative income sources (i.e. employment). If bans are imposed on scavenging production systems, those most likely to be negatively impacted are the landless who rely on scavenging as their feeding choice.

Market restrictions and bans tend to affect semi-intensive producers more than backyard producers, as the former are more intimately linked into formal markets. This was found to be the case in Viet Nam, where live marketing in urban zones was banned. As a coping strategy, some producers withdrew from formalised markets altogether and consolidated their position in the local market. Research in Lao PDR found that market bans have most affected poor traders and processors, who lack the assets necessary to diversify, and who received no type of compensation. In Turkey, although all HPAI-related restrictions were lifted on 16<sup>th</sup> May 2006, a month and a half after the last reported outbreak on 31<sup>st</sup> March 2006, a ban on live markets continued indefinitely, and this has negatively affected small-scale producers who are no longer able to trade in local live markets. Slaughtering restrictions, such as those imposed in Viet Nam where slaughtering in urban areas was only permitted at licensed slaughterhouses, have negatively affected small-scale slaughterers.

Sector restructuring plans in some countries are likely to affect small-scale stakeholders throughout the poultry market chain. There was no mention in the literature reviewed of social impact

assessments carried out around poultry sector restructuring policies. In Viet Nam, there are plans for more concentrated poultry markets with fewer, larger producers, and the squeezing out of small-scale producers. Poultry production would be centralized into certain zones far from residential areas, main roads or markets. Production and slaughtering would be abolished in towns. This is bound to affect small-scale producers, traders, transporters, slaughterers, and processors who do not have the assets such as land, labour or knowledge, to compete in the restructured sector. The government acknowledges that these stakeholders will lose out, and suggests they will change to other, more profitable jobs such as those created by large-scale slaughtering and processing enterprises<sup>6</sup>. This may not be the case, as poor smallholders may not have the assets required to shift their livelihoods to new out-of-town zones, particularly women who generally do not own land. Similarly, a long-term restructuring plan for the poultry industry in Jakarta Province in Indonesia includes: a ban and culling of small poultry flocks; movement of collection points, markets and slaughterhouses; and movement controls. Small-scale producers, traders, input suppliers and slaughterers are unlikely to be able to re-locate their businesses to the new locations. In Thailand, HPAI outbreaks have accelerated sector restructuring in favour of industrialised farms at the cost of small-scale producers. Government regulations that have been set since HPAI to address trade requirements from importing countries have meant that some contract farmers, who do not have the assets to upgrade, have left the business altogether.

Price fluctuations that result from HPAI and control measures affect poor smallholders in several ways. A dramatic drop in prices of poultry produce immediately after an outbreak particularly affects semi-intensive producers in the short-term, as they are at risk of losing all their capital with nothing left to re-invest. Corresponding rises in other food prices affect the poor and poorest producers, as they cannot afford to substitute a decrease in household poultry consumption by buying non-poultry protein alternatives. Price increases of other inputs following an HPAI outbreak, mainly poultry feed, also affects poor producers who can no longer afford these inputs. In particular, this makes it difficult to re-stock after poultry loss, as was reported in Egypt.

Consumer demand influences the livelihoods of all traditional producers both positively and negatively. In Viet Nam, as consumers in Hanoi became more quality conscious, demand for poultry products shifted to supermarkets and other city retail outlets. Traditional producers, who lack access to these outlets, lost their markets. However, research from Viet Nam also found that consumer preference for traditional poultry breeds has allowed some small-scale traditional producers to benefit. Those who had the means to re-invest following an HPAI outbreak capitalised on consumer preference for traditional breeds and were consequently only negatively affected by HPAI for a few months before they could re-start selling.

Perhaps the most serious feature of HPAI-induced vulnerability is the threat of multiple shocks. This is most relevant for very poor households whose livelihoods may not be able to withstand more than one shock at a time. Although there is no evidence of this in the literature reviewed, speculative research into HPAI impact in Ethiopia found that some of the poorest households will not be able to rely on their available assets in the face of multiple shocks, for example HPAI and a failed harvest all at once, which may tip them over into food-insecurity.

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<sup>6</sup> This was stated in a paper produced the Vietnamese Ministry of Agriculture and Rural Development in 2006.

## **Smallholder Household Livelihood Strategies, Coping Strategies, Risk Management Strategies, and their Relationship to HPAI and Control**

Drawing on the analyses above of HPAI-related policies and vulnerabilities, this section examines evidence from the literature relating to HPAI impacts, and presents this evidence through a livelihoods lens. It looks at how the household assets and livelihood strategies of small-scale stakeholders in the poultry sector are affected by HPAI. It also looks at how they manage their available assets to devise coping strategies and risk management strategies in order to respond to the shocks brought about by HPAI and control measures.

### **Human Assets**

#### *Nutrition*

One commonly cited HPAI-related impact is the loss of poultry-derived protein source. This is caused by poultry deaths from virus infection, culling, poultry production bans, and rising prices for poultry produce and other animal protein substitutes, such as red meat and fish. In some countries, specific groups were highlighted as most vulnerable, such as: children, the elderly, pregnant women, as well as the very poor, who keep the smallest share of poultry for home consumption. Poorer households cope by decreasing their expenditure on protein sources or buying cheaper vegetal proteins such as beans, lentils and chickpeas. In Cambodia, poor households were found to be eating sick and dead birds when faced with culling, which is a common practice even in 'non-HPAI' situations where birds showing sign of disease are slaughtered for home consumption. Whilst this would increase their protein consumption in the short term, it would also increase the risk of HPAI infection. Richer households can afford to substitute poultry consumption with other animal and vegetable protein sources. Those who own larger livestock resources are able to increase their milk and dairy consumption. In Jakarta Province in Indonesia, the poultry production ban in cities resulted in non-poor households increasing their expenditure on poultry meat and eggs which they could afford to buy from restaurants.

#### *Labour*

Another commonly cited HPAI-related impact relates to changing labour patterns. Following an HPAI outbreak, some poor households substitute income lost through depleted or abolished poultry sales by selling labour. Research in Cambodia found that whilst selling labour locally (mainly in construction) is a readily available option for poor households who lack the resources to re-invest in poultry, medium and better-off specialist farmers, who were badly affected by HPAI, chose to migrate to cities where they could find better paid employment. Women in Egypt, who are the main owners and managers of backyard and rooftop poultry production, are poorly integrated into the labour market, and are heavily dependent on poultry production and petty trade as income sources. These women found it difficult to find alternative employment following an HPAI outbreak. Only a few found work selling milk and vegetables, seasonal labour and domestic work. Research from Lao found that peoples' working day was lengthened as they turned to alternative income earning strategies, such as fishing and collecting insects and vegetables from forests and gardens, all of which generated less income than poultry production.

HPAI and control measures also affect poultry sector employees. A coping strategy for one group may result in a negative impact for another. Commercial and industrial producers may have to lay off workers as their production downsizes following an HPAI outbreak, and this is not always in affected sites. In Nigeria, for example, research showed that jobs were lost in both affected and non-affected farms.



### *Knowledge of Risk Management*

Knowledge and experience of safer poultry production techniques can be an asset for small-scale semi-commercial poultry producers who wish to maintain or expand their livelihoods within a changing poultry sector. In Viet Nam, for example, field research found that poultry farmers who have worked for large companies had picked up knowledge of industrial poultry farming that would help them if they had the resources to establish their own enterprises in an ever-more industrialised system. Backyard producers, on the other hand, tend to lack this knowledge. In some countries, namely Viet Nam and Cambodia, it was reported that traditional producers rarely attend poultry training courses. Instead larger farmers attend and extend the knowledge to others. In general, and beyond the HPAI / livestock context, agricultural training and extension opportunities are often found to be less accessible to poor farmers in the developing world, so that this reported lack of interest is probably compounded by limited access to relevant and useful knowledge.

Some small-scale producers evidently apply knowledge that is perceived to reduce risk to their production techniques. Examples of this were found across the research reviewed, such as: moving from a scavenging to a semi-scavenging or confined production system<sup>7</sup>; separating chicken houses from the main house<sup>8</sup>; erecting fencing; not allowing poultry into the village from outside (which demands collective action); separating sick from healthy birds. Producers who experience social exclusion, either because they are poor, or for other reasons such as gender imbalances (see *section 2.5* below), are less likely to have access to risk reduction knowledge. It also stands to reason that the more isolated the producer, the less likely they are to learn about the importance of risk reduction strategies through optimizing biosecurity. In Nigeria, for example, where many of the rural poor live far from urban or peri-urban centres, and are linked by a weak or non-existent road infrastructure, one research study speculated that in the event of a rural HPAI outbreak, some producers would have poor knowledge of disease symptoms and appropriate behaviour. However, these physical disadvantages may be counter-balanced by the advantages of living in isolated communities with low population density, where poultry is sometimes kept further away from houses, thus reducing the risk of both human and poultry HPAI infection<sup>9</sup>.

By contrast, even where HPAI-related awareness raising and training is accessible, the literature also highlighted the unwillingness of many small-scale producers to utilise it. This is chiefly because tighter biosecurity measures require capital investment which many cannot afford, especially since their incomes have been affected by HPAI. Even if they can afford it, it is not worth it as the payback is likely to be negative. Thus, non-adherence to advice on risk reduction, however reasonable or unreasonable the advice, becomes for many poor farmers a coping strategy to protect household income. In Turkey, for example, backyard farmers were reportedly reluctant to fence off poultry, as this requires capital investment and supplement feed which they cannot afford, especially now that live poultry is barred from local markets. Many other coping strategies that reflect risky behaviour were identified throughout the literature, and these are listed in *Table 1* below. In Cambodia it was noted that these types of risky coping mechanisms were highest in areas with no direct experience of HPAI, and it stands to reason that the same pattern would be repeated across affected countries.

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<sup>7</sup> It is questionable whether this practice does in fact reduce HPAI risk. Feed carried by farmers from fields to housed birds may be infected. Once infected, the virus will spread quickly amongst housed birds where there is no access to disinfecting sunlight.

<sup>8</sup> The effectiveness of this as a risk reduction measure for bird to human transmission is also questionable as long as it is not known what the main pathway of transmission is from birds to humans. If it is contact at slaughter and preparation, this measure will not reduce risk.

<sup>9</sup> However, this is not always the case. Poultry are often kept close to houses to avoid predators and thieves.

**Table 1: Adverse Coping Strategies Perceived to Protect Livelihood Outcomes**

| <b>HPAI-related Poultry Practices</b>                                                       | <b>How Practice Translates into Coping Strategy</b>                 |
|---------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| Not reporting deaths <sup>10</sup>                                                          | Avoid culling, especially where there is no access to compensation  |
| Hiding animals during culling                                                               | Minimise loss of poultry stock                                      |
| Not fencing off poultry and mixing poultry with other livestock                             | Saves on fencing investment<br>Saves on supplement feed expenditure |
| Inadequate quarantining of new birds                                                        |                                                                     |
| Using dead birds as feed                                                                    | Saves on feed expenditure                                           |
| Scavenging                                                                                  |                                                                     |
| Using poultry faeces for manure                                                             | Saves on manure expenditure                                         |
| Little or no use of protective equipment (i.e. touching sick or dead birds with bare hands) | Saves on protective equipment expenditure                           |
| Giving poultry which died from disease to poor neighbours                                   | Supports protein consumption of poor<br>Work-for-food trade off     |
| Eating sick or birds that have died                                                         | Maintains protein consumption                                       |
| Selling infected chicken                                                                    | Reduces income losses                                               |

Beliefs that underlie these risky practices were identified in the literature. For example, in Cambodia some producers believed that vaccines cause disease and death; and that local breeds are not susceptible to HPAI. Others claimed that HPAI cannot be dangerous for humans because control agencies hired children to catch animals during culling. Only in villages where people had died was there a belief in HPAI as dangerous to humans. In Turkey, some small-scale producers suspected that culling operations were a conspiracy of industrial poultry producers to squeeze them out of the market.

## Financial Assets

### *Income*

Poultry production represents an important financial asset for small-scale producers. This is typically in the form of an income or investment for better-off semi-commercial producers, or as a quick source of cash for poorer backyard producers, since poultry is easier to sell quickly than other larger livestock such as cows or buffalo, and also since households often only need small amounts of cash at one time, much less that would be released from the sale of a buffalo. As quick cash it is used for food, fuel, healthcare, medicine, education, clothing, pocket money, festivities, or emergency expenses such as funerals. Amongst very poor producers in sample study in Egypt, especially female-headed households, poultry-derived income as a share of overall income could be as high as 100%, although on average amongst the poor and very poor it was 44%.

There is little evidence in the literature reviewed of the coping strategies employed by poor producers who lose their quick source of cash as a result of HPAI. In Egypt, female producers claimed that they removed their children from school, while many adapted to a lower income level and rely on husbands' salaries or transfers. In Nigeria, producers claimed that they were forced to take a loan to cover household expenses after an HPAI outbreak. The speculative research into potential HPAI impact in Ethiopia suggests that, in the event of an HPAI outbreak, poor households would cope by reducing non-essential expenditures whilst not needing to forego staple food purchases. This would create an expenditure gap rather than a food gap.

<sup>10</sup> As well as representing a coping strategy to avoid culling, not reporting deaths can also be because animal health services are deemed to be unresponsive and therefore it is pointless to report.

Similarly, there is little evidence in the literature of coping strategies of semi-commercial producers who use poultry-derived income as an investment for inputs such as feed and biosecurity measures. In Nigeria, small-scale commercial producers, especially civil servants, admitted an inability to cope with the income shocks and were unable to return to former levels of production. A decrease in prices for poultry products meant that some farmers could no longer afford workers' salaries, and as a coping mechanism had to lay off employees and downsize their flock to numbers they could maintain.

Incomes of other stakeholders in the poultry market chain are also vulnerable to the dampened market caused by HPAI. In Nigeria, restaurant owners, fast food outlets, roadside roasted chicken sellers and egg sellers had to downsize their operations or switch to alternative products such as fish and goats. In Lao PDR, the total loss of income for some market sellers caused a permanent reduction in their livelihoods. The medium poor could draw on savings and labour but this is not sustainable in the long-term. Only the larger market sellers had sufficient assets to maintain their current living standards for the duration of the market bans.

In general, the poorer the household, the worse they are affected by a decrease in poultry-derived income. Research into likely impact of HPAI in Ethiopia concludes that those very poor households in areas where there are few income opportunities are most at risk of food shortage<sup>11</sup>. By contrast, less poor producers have the financial capital to re-invest and implement the required biosecurity measures to minimize risk, or take advantage of rising prices in other products and invest in an alternative business.

#### *Credit*

Some small-scale producers have been unable to repay loans they took to start their business. In Cambodia, research found producers who were forced to sell their assets after an HPAI outbreak in order to repay loans taken from micro-finance institutions. In Viet Nam, lenders who offered formal loans to farmers prior to HPAI stopped these loans after HPAI for fear of farmers defaulting. In Egypt, traders refused to provide new chicks to poorest and poor households because they were already in debt and could not provide the required deposit, although small.

### **Physical Assets**

#### *Poultry*

The size of a household's poultry flock determines the size of its poultry-derived income. According to FAO's four-sector categorisation, backyard producers ("Sector 4") own between one and fifty birds, and small-scale semi-industrial producers own between 50 and 1000. Even though poultry does not represent a significant portion of household income for backyard producers, it is an important livelihood asset for all small-scale producers, whether subsistence or semi-commercial. This is for three key reasons: (i) it requires very little labour; (ii) it is low-input low-investment; and (iii) it has short generation and high reproduction rates. A common feature amongst backyard poultry producers across the literature is their preference for raising local breeds. Although these are often of lower production potential than imported breeds, domestic consumers tend to prefer them for cultural reasons, as well as for the fact that they prefer their taste and texture. In Viet Nam, for example, local breeds have yellow feathers and skin favoured by consumers for traditional festivals and family offerings. Urban restaurants label them as 'special chicken' and charge two to three times the price of industrial chicken, with urbanites willingly paying for these attributes.

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<sup>11</sup> However, this is context dependent; some literature points to the fact that the very poor are not worst affected as they do not depend on poultry for their income and can sell their labour if they need to (see Section 2.4.1, under *Labour*, above).

One direct impact of HPAI and control measures is a dramatic decrease in affected producers' flocks. This is for four key reasons: poultry deaths from virus infection; culling; production bans; and reluctance to restock. Other control measures are also indirectly responsible, such as bans and restrictions on markets, trading, movement and slaughtering of poultry, all of which impose production constraints and lead to lower outputs.

Some producers, who have the assets to re-invest following an HPAI outbreak, have capitalised on domestic consumers' preference for traditional breeds. Poorer households, who have lost their poultry stock as a result of HPAI, may choose to raise alternative birds to chickens. These can represent a key source of income and consumption. Pigeon-rearing was identified as one coping strategy amongst backyard producers in Egypt following an HPAI outbreak. Pigeons offer a viable livelihood alternative to chickens for several reasons: they are cheap; they have low input requirements; they have high reproduction rates and short reproduction cycles; they can be acquired through informal channels; and they have high market demand. In addition, they are less susceptible to HPAI than chickens.

#### *Other Livestock*

Non-poor farmers are likely to own other livestock as an alternative livelihood resource. This was found to be the case in much of the literature reviewed, most commonly with reference to cows and pigs, (and rabbits in Viet Nam). These alternative livestock resources can either contribute towards consumption, or substitute lost income, or represent an asset whose sale or collateralization can be used to re-start poultry production.

### **Social Assets**

#### *Social Capital*

Family and non-family networks can assist poor households to withstand shocks such as HPAI. Research in Cambodia found that poor farmers may receive one or two chickens from relatives or neighbours to assist them in starting up a small-scale poultry enterprise, or to re-stock after losing their flock to HPAI or culling. Also in Cambodia, richer households offered their sick or dead birds to poorer households instead of having them culled. Better-off farmers who fell into debt after the HPAI crisis received assistance from relatives working abroad or in cities. Producers can also draw on social capital to acquire knowledge of new improved production techniques. In Cambodia, for example, relationships between new and experienced duck producers were found to be important. Experienced producers, who had built up a long history of knowledge, and who sometimes work as Village Animal Health Workers (VAHW), provided invaluable technical support to new producers, especially in areas of feed, vaccination and medicine.

Producer groups, that enable small-scale producers to access markets, can also be negatively affected by HPAI and control. In Indonesia for example, the Jakarta decree has resulted in the disbanding of farmers' groups.

#### *Religious Festivals and other Ceremonies*

There are many references in the literature to the role of poultry, especially traditional breeds, in cultural and religious ceremonies and festivities. In Indonesia, for example, Kampong chickens and ducks play an integral role in the local religion and culture. In Egypt, eggs are a valued asset during religious festivities such as the Islamic festivals of Ramadan and Sham El Nesim – Spring Day – when painted eggs represent renewal of life – and the Christian festival of Easter which Copts also celebrate with eggs. Research from Egypt also lists other ceremonies when poultry meat and eggs are used: weddings; births (when the mother has to eat chicken daily for 40 days); deaths (when neighbours are expected to provide food for three days including poultry meat); and for sickness

(normally in the form of chicken soup). Women claimed that by losing this asset they were unable to maintain these critical social relations.

### *Prestige*

Poultry ownership can also attract prestige for the owner. Across the literature this was cited as gifts or exchanges to relatives and neighbours, or as a meal for special guests. Presumably, in the event of poultry loss, this role of poultry as a form of prestige would be the first to be dropped by smallholder producers in favour of household food and income security.

## **Natural Assets**

### *Land*

Land ownership is significant as an asset that will benefit small-scale producers in countries experiencing sector re-structuring. In Viet Nam, for example, farmers who own land may be able to transfer their poultry production to centralised poultry farming, whereas those small-scale producers who own little or no land will not be able to upgrade their production status.

In contrast, poor landless households who choose to keep poultry can only practice scavenging techniques (either on common land, in the street, or on other peoples' land). They are likely to be negatively affected if scavenging is banned as part of risk reduction strategies<sup>12</sup>.

### *Insect and Pest Control*

Smallholder poultry producers regard one of the side-benefits of poultry ownership that it protects crops from insects and pests. A decrease in poultry numbers would therefore reduce this asset for farmers who may not be able to afford alternative insect and parasite control measures. There was no evidence in the reviewed literature of how important this side-benefit is perceived to be, or alternative coping strategies in the event of poultry loss from HPAI.

## **Gender Analysis**

Women are typically the main owners and managers of backyard poultry production. Amongst many poor households, where women's mobility, income earning opportunities and access to formal markets is restricted, poultry rearing is often amongst womens' most important livelihood assets. Their duties include: feeding; watering; cleaning; detecting sickness; seeking veterinary care; buying feed and medicine; making decisions about selling; and managing poultry-derived income. This means that they are more likely to suffer from loss of poultry and other HPAI-related impacts.

There are several references in the reviewed literature to the psychological stress suffered by poultry loss being felt more by women than by men. In Indonesia, the Jakarta decree banned poultry production in urban areas. As a result of this, many households devised a coping strategy of moving their ducks away from residential areas, which meant that women have become less involved in duck raising. In Egypt, where rooftop and backyard poultry production is managed by women, research found that HPAI resulted in lowered self-esteem amongst women as they lost their financial independence and had to rely more on husbands' incomes. This apparently leads to tension and conflict within the household. Women also lose their sense of pride as they can no longer contribute towards saving for special occasions such as a daughter's wedding.

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<sup>12</sup> In this case, some landless may be able to turn to rooftop production as an alternative.

As production output increases and becomes more commercial, men tend to take control of major decisions. Gender analysis in Viet Nam found that amongst smallholders who own 1 to 50 birds, the only decisions taken by men revolve around investing and extending production. By contrast, amongst larger-scale producers with 50 to 200 birds, whilst women retain daily husbandry duties, men become involved in the production and management, purchasing of inputs, and liaising with outside suppliers. Another common pattern is that men have greater access to training, which in turn gives them greater power over more important decisions.

In some countries, women dominate other positions in the small-scale poultry marketing chain. In the event of HPAI shocks, many of these may not have the assets to diversify. In Lao PDR, research found this to be the case amongst female traders and processors who were negatively affected by trade bans. In Viet Nam research found 89% of assemblers, 64% of wholesalers and 100% of retailers were women. According to the country's plans for sector restructuring, poultry production will be centralized into zones away from residential areas, main roads or markets, and production and slaughtering will be abolished in towns. Since ownership of land and other large assets is normally registered under the male household head, small-scale female stakeholders in the poultry value chain may suffer more than men as they are unlikely to have the assets required to operate in new locations. Social impact assessments carried out to inform sector restructuring should include gender analysis to assess likely impacts such as these.

## What Else Do We Need To Know?

As already noted, the findings presented in *Section Two* present an incomplete picture. This section highlights gaps where further livelihoods-related research could focus to bring a clearer understanding of who, amongst the poor, are most vulnerable to HPAI shocks, and how.

### Poverty Analysis

Most of the literature on HPAI impact uses four different groups within the poultry production sector as its centre for analysis, with secondary mention of the poverty status of households (such as very poor, poor, medium poor etc). The different groups within the poultry production sector that are referred to differ depending on the country and the authors, but most of them echo in some way FAO's four-sector categorisation. What is missing in much of the literature is consistent analysis of HPAI impact that merges two categorisations: position in the poultry sector value chain; and socio-economic status<sup>13</sup>. What is needed is research that takes as its central focus of analysis poor smallholder households who are dependent on the poultry sector in some way. By re-adjusting the focus from production group to poverty status, this approach will:

- highlight socio-economic groups whose income and food security are threatened by the risk of HPAI;
- allow for deeper impact analysis of stakeholders in the poultry value chain other than producers;
- enable policy makers, livestock service providers and development practitioners to target HPAI-related risk reduction strategies that protect the livelihoods of the poor.

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<sup>13</sup> The recently completed livelihoods study from Lao PDR serves as an example of how this might look. Production systems are divided into variations of intensive and extensive, and socio-economic groups are divided into medium-rich, medium-poor, poor and very poor. Using this as a framework, the analysis describes impacts that relate to socio-economic status, for example some households move from being medium-rich to medium-poor as a result of HPAI. Research from Cambodia, Turkey and Viet Nam also combines, to varying extent and depth, analysis of HPAI impact on production groups, with reference to different socio-economic groups.

## Gender Analysis

Women play a major role in the small-scale poultry sector, especially backyard production. HPAI-related impact assessments should include rigorous gender analysis, and this is missing in much of the literature<sup>14</sup>. How does access to, and control over relevant assets for managing HPAI threats differ between men and women? Of particular interest would be a gendered analysis of the likely impact of sector restructuring on semi-intensive producers, as this may involve upheaval and re-arranging of household livelihood assets that are often owned and controlled by men.

## HPAI Impact on Stakeholders in the Poultry Value Chain other than Producers

There are references in the reviewed literature to the impact of HPAI and control measures on smallholders in the poultry sector other than producers. These references are normally made in passing, such as mention of small-scale traders, slaughterers, transport operators, and input suppliers all being affected by trade bans, movement restrictions and temporary price decreases in poultry. This is probably because much of the literature takes as its central focus different production sectors, and therefore focuses primarily on different types of producers. More analysis is needed to explain how the livelihoods of stakeholders in the poultry value chain other than producers are vulnerable to HPAI-related shocks and how they rearrange their resources to mitigate food and income insecurity (see *Section 3.1* above).

In addition, analysis around the interconnectedness and inter-dependence of all stakeholders in the poultry value chain seemed to be missing from the literature reviewed. Because this is a form of social capital, it would be interesting to know to what degree are all smallholders in the poultry sector dependent on each other for protecting and enhancing their livelihoods? Research into poultry-based livelihoods of the rural poor in West Bengal in India, for example, found that the livelihoods of all stakeholders in a particular poultry value chain were dependent on each other<sup>15</sup>.

## Likely Impact of Sector Restructuring

In countries where sector restructuring is underway or planned (such as Thailand, Viet Nam, Indonesia, Cambodia), there is little discussion of its likely impact on the livelihoods of smallholders in the poultry sector, except to mention that they will, or already are, losing out. Social impact assessments are needed around sector policy and planning that highlights the likely impact on those groups who may not have the assets to change their livelihood strategies and compete in the changed environment.

## Geographical Position of Smallholders

The geographic location of a small-scale producer will dictate how badly they are affected by an HPAI outbreak by influencing their access to a number of assets such as: markets; information; long and short-term risk mitigation strategies. Three key geographical factors need to be considered. Firstly, how far away are they from the outbreak? Secondly, how does their rural, urban or peri-urban status affect impact<sup>16</sup>? Thirdly, does impact on poor smallholders differ according to whether the country under study is relatively rich, such as Egypt, or poor, such as Cambodia?

## Long- and Short-Term Impact

HPAI-related impact will cause either permanent or temporary loss of food or income security for certain groups. One gap identified in the literature reviewed relates to this differentiation. Future research needs to highlight which groups lack access to sustainable coping strategies, and have been tipped into long-term food or income insecurity as a result. If children have been taken out of school

<sup>14</sup> Gender analyses of the poultry sector have been carried out in some countries, but this does not always translate into gendered analyses of HPAI impact.

<sup>15</sup> This paper was reviewed as a draft. It is not included in the bibliography.

<sup>16</sup> Most impact studies are carried out amongst urban and peri-urban populations.

as a coping strategy against income loss, did they return after some time, and if not what are they doing? Which small-scale businesses that downsized as a result of HPAI never regained former levels of income, and how has this affected the owner in the long-term?

Related to this point is the issue of protein consumption. As noted in *Section 2.4.1* above, there is frequent mention in the reviewed literature to the impact of HPAI on reduced protein consumption. However, with no pre-HPAI baselines available relating to nutrition levels, there is no evidence of the long-term impacts of reduced protein consumption, with pre- and post-HPAI data to illustrate impact. This is likely to become more of an issue as safer biosecurity and prevention measures are embedded in affected countries.

### **Compensation and other Short-Term Mitigation Strategies**

Where compensation schemes are discussed in the literature reviewed, this is largely from a supply-side perspective, such as: percentages of poultry value paid; delayed payments; insufficient amounts; confused messages given to producers. This should be complemented by analysis relating to access and impact of different compensation schemes on smallholder producers, especially women. The same applies to other short-term risk-mitigation schemes offered. There was no evidence in the literature of evaluations around post-HPAI micro-credit or re-stocking schemes offered to affected smallholder producers<sup>17</sup>.

### **Attitudes and Behaviour**

A series of studies have analysed attitudes and behaviour in relation to HPAI in order to explain why some producers practise certain risky coping strategies. It would be interesting to supplement these studies with analysis of how risk-reduction strategies change amongst households who have either experienced a human death from HPAI, or who live close to a household who has. Some research (for example in Nigeria, Egypt and Cambodia) explores HPAI-related impact in affected and non-affected areas, but does not cover reactions to human deaths from HPAI. Also useful, would be analysis of which biosecurity measures different small-scale producers would be willing to adopt, and why. This would assist in the design communication and awareness campaigns, and risk-reduction strategies that respond to local contexts.

### **Stakeholder Participation**

Public voice is an important asset for poor people. Nothing was found in the literature around smallholder participation in the design of long- and short-term control and mitigation policies that affect them. Where are the opportunities for smallholders to influence and comment on policies that affect their livelihoods? This would be especially relevant in countries where sector restructuring coincides with decentralisation of agricultural or livestock ministries. Have there been any attempts to capitalise on opportunities offered by decentralisation by encouraging greater participation of smallholder producers in poultry-related policies and programmes?

## **Conclusions and Messages for Pro-Poor Risk Reduction**

The preceding two sections have summarised the findings and gaps from the literature reviewed relating to HPAI, livelihoods and poverty. These are summarised in *Table 2* at the end of this section. As a recent FAO paper on HPAI and livelihoods has pointed out (FAO/LSP 2008), HPAI control is not only a biosecurity issue but also a development challenge. In order to address this challenge, there must be further analysis of who are the groups whose livelihoods are most vulnerable to the impact of HPAI. Various recommendations were extracted from some of the literature that supports this

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<sup>17</sup> This is not to say evaluations do not exist, only that they were not reviewed for this paper.



analysis. These are summarised and briefly discussed below. They are meant to provide a basis for further discussion.

### **Targeting Women and Women-headed Households**

There are a number of references in the literature to the need to target women in HPAI assistance initiatives. This is because they are the main managers of backyard poultry production, and in some cases they participate to a considerable extent in the poultry value chain. However, at the same time they have less access to assets such as training, credit, communication and awareness, or alternative employment and income earning opportunities (see *Section 2.5* above).

Gender analysis around HPAI issues is important for ensuring that risk reduction strategies consider women's role in the poultry sector. However, agricultural development programmes in general too often call for gender aware measures such as: '*increased access of training and extension services to women*', or '*target women with income generating programmes*'. In reality, successful outcomes of these measures will depend on long-term structural changes in gender dynamics. Policy and planning around risk reduction strategies ought to take this into account and not incorporate unrealistic gender-related indicators. Programmes that target women need to be carefully designed otherwise they run the risk of alienating men, who are often the opinion leaders in rural communities.

### **Emergency Assistance**

Compensation policies differ amongst countries and in some (such as Cambodia) they are non-existent. There are many recommendations in the literature reviewed around compensation. These include: direct payments to owners who have had their flocks culled; provision of a fund to encourage reporting; loans and micro-credit for restocking and rehabilitation; and provision of clear information about availability of compensation to avoid confusion and misplaced expectations amongst producers.

It is clear from the literature reviewed that compensation for affected poor producers will tide them over until they can re-stock or initiate alternative livelihood coping strategies. Although unsustainable in the long-term, compensation, or other short-term safety net measures will prevent the poor from falling into temporary food- or income insecurity.

### **Long-Term Assistance**

A number of different options are given for long-term assistance to poor producers who are either directly or indirectly affected by HPAI. These include:

- loans and micro-credit to encourage livelihoods diversification, including non-agricultural alternatives;
- assistance to improve poultry inputs during rehabilitation;
- creation of producer organisations that cut out middlemen;
- development assistance that is dependent on risk reduction;
- concentration of efforts where livelihoods are most vulnerable to HPAI shocks;
- mainstreaming safe poultry practices into general livestock and community development programmes;
- long-term pro-poor assistance should focus on production systems in general rather than a single disease (in this case HPAI);
- provision of further assistance if rehabilitation is delayed for over a year, such as education;
- increased quality and coverage of extension services to poor producers.

The success of assistance to poor smallholders will depend on a number of factors, such as: extent of poverty; livelihood strategies and coping mechanisms; size of landholding; type of poultry production; extent of biosecurity measures in place; size and number of HPAI outbreaks; government

policy around HPAI prevention and control; external programme funding; willingness of poor households to participate. Development assistance programmes which combine risk reduction strategies with long-term sustainable development options are more likely to prevent poor households falling into deeper poverty as a result of HPAI. Development assistance should also be considered for small-scale stakeholders in the poultry value other than producers, who, according to the reviewed literature, are also indirectly affected by HPAI, such as traders, slaughterers, input suppliers, transporters. Furthermore, targeting of assistance programmes should be done with the knowledge that for some smallholders, the most viable option is to leave the poultry sector altogether and seek alternative livelihoods, especially if they cannot afford to implement the biosecurity measures imposed on them.

### **Communication and Awareness-Raising**

Several recommendations were extracted from the literature around HPAI-related communication and awareness strategies. The most common is that safety messages must fit into existing livelihood patterns, and be informed by an understanding of why poor people do what they do. An important finding is that traditional extensive producers, with minimal financial assets, do not regard expenditure and investment on safer poultry rearing practices as income well-spent (see *Section 2.4.1* above). The challenge is to devise practical risk reduction messages, such as: construction of chicken houses; quarantining of new birds; and hygiene practices that take limited assets into consideration and challenge misleading beliefs around HPAI.

Table 2: Summary of Findings and Gaps Relating to HPAI, Poverty and Livelihoods

| Livelihoods Focus                                  | Key Points Relating to Small-scale Stakeholders and HPAI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                | What else do we need to know?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Prevention, Control and Mitigation Measures</b> | <p>Culling.</p> <p>Production, market, slaughtering and movement bans and restrictions.</p> <p>Sector restructuring in favour of industrialised production.</p> <p>Weak extension and vaccination services.</p> <p>Compensation offered in varying degrees in some but not all countries.</p> <p>Micro-credit and re-stocking schemes offered to poor affected producers.</p>                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                | <p>What is the likely impact of sector restructuring on smallholders in the poultry sector who lack the assets to upgrade or shift their businesses?</p> <p>What is the impact of short-term mitigation schemes on poor HPAI-affected producers, such as compensation, micro-credit or re-stocking assistance?</p>                                                                                                                                                                                                                                                                                                                       |
| <b>Vulnerabilities</b>                             | <p><b><i>Which groups are most vulnerable to HPAI?</i></b></p> <p>Poultry deaths affect semi-commercial producers who have invested heavily in poultry.</p> <p>Culling measures affect producers who have little or no access to compensation.</p> <p>Bans and restrictions of production, marketing, slaughtering and transport affect producers, traders, processors, slaughterers, input suppliers and transporters.</p> <p>Sector restructuring is likely to impact negatively those who lack the assets to upgrade or move their production. Price fluctuations result in decreased income and consumption patterns.</p> | <p><b><i>Coping Strategies</i></b></p> <p>Some leave the business.</p> <p>Seek employment.</p> <p>Not reporting deaths.</p> <p>Hiding poultry.</p> <p>Selling poultry that has died.</p> <p>Leave the business.</p> <p>Withdraw from formalised markets.</p> <p>Seek alternative income options.</p> <p>Only those who have the necessary assets will be able to compete.</p> <p>Switch to contract farming.</p> <p>Raise other livestock.</p> | <p>Information relating to poverty and livelihoods of smallholder households whose livelihoods are dependent on poultry as a central focus. This would answer the following questions:</p> <ul style="list-style-type: none"> <li>• Which are the socio-economic groups whose food and income security are most threatened by the risk of HPAI?</li> <li>• Which poor stakeholders in the poultry value chain other than producers are most vulnerable to the threat of HPAI?</li> <li>• What are appropriate policies and programme that would reduce HPAI risk as well as protect the livelihoods of these poor households?</li> </ul> |

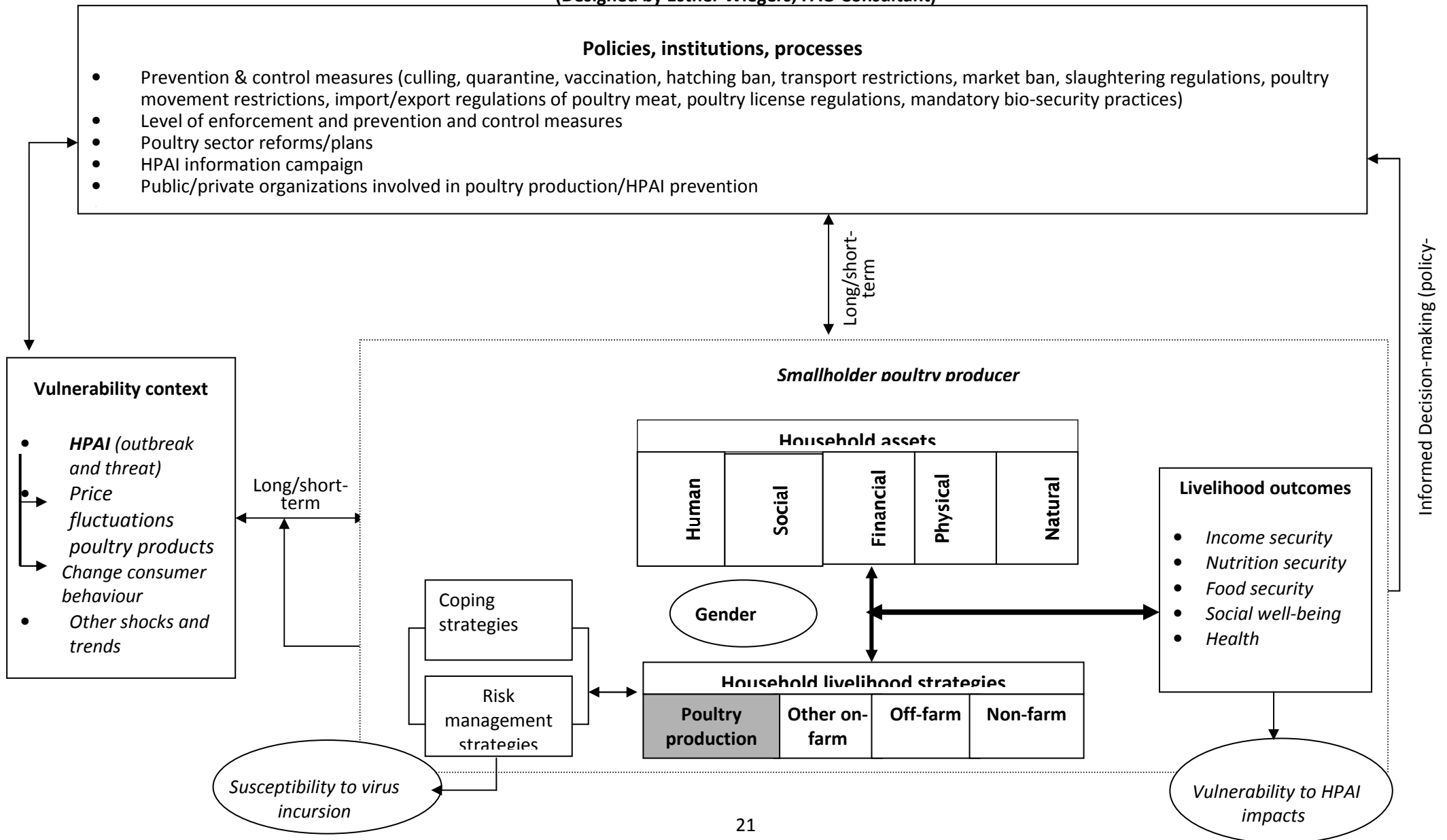
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|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                          | Very poor households may be vulnerable to the threat of multiple shocks at once, including HPAI. Price fluctuations affect all small-scale producers.                                                                                                                                                                                    | Some capitalise on demand for domestic breeds, while others can improve product offerings.<br><br>Reduce household consumption expenditure.                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                             |
| <b>Livelihoods Focus</b> | <b>Key Points Relating to Small-scale Stakeholders and HPAI</b>                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>What else do we need to know?</b>                                                                                                                                                                                        |
| <b>Human Assets</b>      | <p><b>Asset</b><br/><u>Household consumption of protein</u><br/>Decreased household protein consumption.</p> <p><u>Labour</u><br/>Change in labour patterns.<br/>Working day lengthened.<br/>Employees laid off.</p> <p><u>Knowledge and awareness</u><br/>Traditional extensive producers lack knowledge and awareness around HPAI.</p> | <p><b>Coping Strategies</b><br/>The poor decrease animal protein expenditure or buy cheaper vegetal proteins. Some eat sick or dead birds to avoid culling.</p> <p>Richer households increase milk and dairy consumption and buy substitute protein sources.</p> <p>Poor households sell labour to substitute lost income from HPAI<br/>Richer households migrate to cities to find better jobs.</p> <p>Application of risk-reduction strategies to maintain production<br/>Non-application of risk-reduction strategies to safe-guard income.</p> | <p>How does risk reduction behaviour change once a household or neighbourhood has experienced a human death from HPAI?</p> <p>Which biosecurity measures are different small-scale producers willing to adopt, and why?</p> |
| <b>Financial Assets</b>  | <p><b>Asset</b><br/><u>Quick source of cash</u><br/>Traditional extensive producers lose a quick source of cash.</p>                                                                                                                                                                                                                     | <p><b>Coping Strategies</b><br/>Adapt to lower income.<br/>Reduce expenditure on non-essential items. Take loans to cover household</p>                                                                                                                                                                                                                                                                                                                                                                                                            | <p>More information on the financial sustainability in the long-term of coping strategies of all poor producers. For example:</p> <ul style="list-style-type: none"> <li>• Have businesses that downsized</li> </ul>        |

|                          |                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                          | <p><u><i>Income and Investment</i></u><br/>Semi-commercial smallholders lose a source of income and investment and access to loans. Producers already in debt no longer have access to loans.</p> <p><u><i>Credit</i></u><br/>Smallholders already in debt lose access to loans.</p> | <p>expenses.<br/>Remove children from school.</p> <p>Downsize business; including laying off employees and reducing flock size.<br/>Leave the business.<br/>Less poor re-invest or switch to alternative livelihood strategies.<br/>Draw on savings and labour until shock is reduced.</p> <p>Sell assets.</p> | <p>returned to normal levels of production?</p> <ul style="list-style-type: none"> <li>• have children who were removed from school, returned, and if not what are they doing?</li> </ul>                                                                                                                                                                                                                                                                                                      |
| <b>Livelihoods Focus</b> | <b>Key Points Relating to Small-scale Stakeholders and HPAI</b>                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                | <b>What else do we need to know?</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Physical Assets</b>   | <p><b>Asset</b><br/><u><i>Poultry</i></u><br/>Decrease in poultry stock as a result of HPAI virus infection, culling and production bans.</p>                                                                                                                                        | <p><b>Coping Strategies</b></p> <p>Raise alternative birds such as pigeons.<br/>Draw on other livestock such as cattle as alternative livelihood source.<br/>Leave the business.<br/>Those who can afford to re-invest capitalise on domestic preference for local breeds.</p>                                 | <p>What is the significance of geographic location to HPAI impact on small-scale producers? For example:</p> <ul style="list-style-type: none"> <li>• How important is distance of affected producers from outbreak?</li> <li>• How does their location affect their access to markets, information and risk mitigation assistance?</li> <li>• How important is the difference between urban, peri-urban or rural location of all affected stakeholders in the poultry value chain?</li> </ul> |
| <b>Social Assets</b>     | <p><b>Asset</b><br/><u><i>Social Capital</i></u><br/>Loss of social status through inability to meet social / ritual obligations, such as: offering poultry to guests; use of poultry in religious ceremonies; gifting poultry to relations and neighbours.</p>                      | <p><b>Coping Strategies</b></p> <p>Receive assistance from relatives or neighbour to re-start poultry production or maintain food security.<br/>Learn new production techniques</p>                                                                                                                            | <p>Analysis of opportunities for poor smallholders to participate in the design of long- and short-term control and mitigation strategies that affect their livelihoods.</p>                                                                                                                                                                                                                                                                                                                   |

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|                       | <p><i>Festivals, ceremonies and prestige</i><br/>Poultry lost as an asset for religious festivals, other ceremonies and a badge of prestige.</p>                                                                                        | <p>from more experienced producers.</p>                                                                                                                  |                                                                                                                                                                                    |
| <b>Natural Assets</b> | <p><b>Asset</b><br/><u>Land</u><br/>Land may be a valuable asset to help compete in sector re-structuring.<br/>Loss of poultry as insect and parasite control.</p>                                                                      | <p><b>Coping Strategies</b><br/>Land ownership may enable some producers to compete in restructured poultry sector or to switch to contract farming.</p> | <p>What is the pest and insect damage losses related to the loss of poultry due to HPAI?<br/><br/>How can land ownership issues be overcome in Viet Nam’s restructuring plans?</p> |
| <b>Gender Roles</b>   | <p><b>Impact of HPAI</b><br/>Women, as main managers of small-scale production are most likely to suffer from: decreased household income; decreased self-esteem and independence; increased tension and conflict within household.</p> | <p><b>Coping Strategies</b><br/>Petty trade, domestic labour.<br/>Relying on husbands salaries.</p>                                                      | <p>How does access to, and control over assets for managing HPAI threats differ between men and women?<br/>What is the likely impact of sector re-structuring on women?</p>        |

### ANNEX 1. A Livelihood Lens Adapted for HPAI

(Designed by Esther Wiegers, FAO Consultant)



## ANNEX 2. Bibliography

| GENERAL                     |                                                                                                                                                                                                                                                            |              |                                                                                                                                                                                                                                                                |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Author</i>               | <i>Name of Paper</i>                                                                                                                                                                                                                                       | <i>Date</i>  | <i>Relevance to Poverty and Livelihoods</i>                                                                                                                                                                                                                    |
| FAO (Wiegers)               | HPAI, Gender and Smallholder Poultry Producers: Viewing the Linkages through a Livelihoods Lens                                                                                                                                                            | 2008 (draft) | Adapts the DFID sustainable livelihoods framework for HPAI, gender and smallholder poultry producers.                                                                                                                                                          |
| FAO / LSP                   | Highly Pathogenic Avian Influenza and Sustainable Livelihoods (HPAI): Managing Risk and Developing Options                                                                                                                                                 | 2008         | Argues for the need of a livelihoods perspective in HPAI research.                                                                                                                                                                                             |
| FAO (Curry, J. & McLeod, A) | HPAI, Poverty and Livelihoods: a Review of Recent FAO Experiences in the Socio-Economic Analysis of HPAI Impacts. (Presentation at workshop on Research Activities on Avian Influenza and Other Transboundary Animal Diseases in South-East Asia, Bangkok. | 2008         | Useful summary of key issues relating to HPAI, poverty and livelihoods.                                                                                                                                                                                        |
| DfID / HPAI Research Brief  | Flock Size and HPAI Risk in Cambodia, Thailand and Viet Nam                                                                                                                                                                                                | 2008         | Argues that larger-scale commercial poultry producers are more at risk of HPAI than smallscale backyard producers. Concludes that governments can avoid unnecessary suffering for rural poor by informing their policies with evidence-based risk assessments. |
| FAO (Sims, L.D)             | Risks associated with Poultry Production Systems                                                                                                                                                                                                           | 2007         | Examines main reasons behind choices to implement biosecurity measures and discusses implications. Centre of analysis is production sectors.                                                                                                                   |
| CARE International          | Community Based Avian Influenza Risk Reduction Programme: Baseline Survey Report                                                                                                                                                                           | 2007         | Overview of knowledge, awareness and behaviour patterns around HPAI.                                                                                                                                                                                           |
| <i>Author</i>               | <i>Name of Paper</i>                                                                                                                                                                                                                                       | <i>Date</i>  | <i>Relevance to Poverty and Livelihoods</i>                                                                                                                                                                                                                    |
| FAO, (McLeod et al.)        | Economic and Social Impacts of Avian Influenza                                                                                                                                                                                                             | 2006         | Summarises HPAI impacts, including analysis of impact on poor sector 4 households.                                                                                                                                                                             |
| FAO                         | HPAI Impacts on Poverty, Livelihoods , Vulnerability and Household Coping Mechanisms of Smallholder Poultry Producers.                                                                                                                                     | 2006         | A clear livelihoods and poverty-related summary of likely HPAI impacts on the household. Draws on FAO insights from socio-economic HPAI and                                                                                                                    |



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|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                    | (Discussion paper prepared for meeting: Towards a Coordinated IASC Approach to Avian & Human Influenza, Geneva, February 2006)                                                                            |             | HIV/AIDS impact studies in Southeast Asia                                                                                                                                                                                                                                    |
| FAO (Curry, J)                                     | Market Impacts as Hidden Costs of Avian Influenza on Rural Livelihoods and Households. (for FAO Symposium on Markets and Trade Dimensions of Avian Influenza Prevention and Control)                      | 2006        | Uses a sustainable livelihoods framework to examine HPAI-related impact of market shocks on rural households. Focuses discussion on sectors 3 and 4.                                                                                                                         |
| World Bank (with FAO, IFPRI & OIE)                 | Enhancing Control of Highly Pathogenic Avian Influenza in Developing Countries through Compensation: Issues and good Practice.                                                                            | 2006        | Provides guidelines for good practice in HPAI-related compensation for national and international managers and project staff. Examines compensation issues around FAO's 4-sector production categories. Covers some social issues such as ownership by gender and awareness. |
| FAO (Dolberg et al)                                | Emergency Regional Support for Post-Avian Influenza Rehabilitation: Summary of Project Results and Outcomes                                                                                               | 2005        | Covers Cambodia, Thailand, Indonesia, Viet Nam and Lao. Useful analysis of HPAI impact which draws on livelihoods framework. Examines production systems, coping mechanisms and different types of institutional support                                                     |
| FAO (Rushton et al)                                | Impact of Avian Influenza Outbreaks in the Poultry Sectors of Five South-East Asian Countries (Cambodia, Indonesia, Lao, Thailand, Viet Nam): Outbreak Costs, Responses, and Potential Long-Term Control. | Undated     | Useful Summary of HPAI impact.                                                                                                                                                                                                                                               |
| <b>VIET NAM</b>                                    |                                                                                                                                                                                                           |             |                                                                                                                                                                                                                                                                              |
| <b>Author</b>                                      | <b>Name of Paper</b>                                                                                                                                                                                      | <b>Date</b> | <b>Relevance to Poverty and Livelihoods</b>                                                                                                                                                                                                                                  |
| DfID / HPAI Research Brief (Ifft, J et al.)        | HPAI Control from a Demand Side Perspective                                                                                                                                                               | 2008        | Drawing on initial results from Hanoi consumer surveys, finds significant concern about food safety. Concludes that HPAI safety can be promoted from the demand side                                                                                                         |
| DfID / HPAI Research Brief (Roland-Holst, D et al) | Adjustment of smallholder Livestock Producers to External Shocks: The Case of HPAI in Viet Nam                                                                                                            | 2008        | Uses macro-economic statistics to make the case that diversification assistance is better than compensation in the case of HPAI.                                                                                                                                             |
| Agrifood Consulting International (for FAO)        | The Economic Impact of HPAI on the Vietnamese Poultry Sector (Draft Factsheet)                                                                                                                            | 2008        | Main message is that poultry production is minimal in significance for sector 4 households and therefore the impact of HPAI and control is correspondingly minimal. Based on primary field data as well as secondary.                                                        |

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|--------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Agrifood Consulting International (for FAO)      | Gender Analysis in Poultry Production (Draft Factsheet)                                                                                                                               | 2008        | Gender analysis of the above. Details different gender roles in poultry production. Quite generalised.                                                                                                                                                                                                                                                     |
| FAO (PPLPI Research Report)                      | The Poultry Sector in Viet Nam: Prospects for Smallholder Producers in the Aftermath of the HPAI Crisis                                                                               | 2007        | Overview of pre- and post-HPAI poultry sector in Viet Nam. Main message is that poultry sector restructuring will have negative impacts on traditional poultry producers, and recommendations are given to mitigate these.                                                                                                                                 |
| <b>Author</b>                                    | <b>Name of Paper</b>                                                                                                                                                                  | <b>Date</b> | <b>Relevance to Poverty and Livelihoods</b>                                                                                                                                                                                                                                                                                                                |
| Viet Nam Women's Union                           | AIERP: Poultry Restocking Impacts for Smallholders. Presented at the workshop on The Future of Poultry Farmers in Viet Nam after Highly Pathogenic Influenza                          | 2007        | Although the title implies this is an evaluation, it is in fact a description of the project.                                                                                                                                                                                                                                                              |
| FAO (Roland-Holst et al.)                        | External Shocks, Producer Risk, and Adjustments in Smallholder Livestock Production: The Case of HPAI in Viet Nam. (for workshop on Future of Poultry Farmers in Viet Nam after HPAI) | 2007        | Drawing on stock loss statistics from Viet Nam, evaluates significance of alternative coping strategies, using a risk management / risk coping framework. The aim is to provide a clearer understanding of smallholder responses to adverse shocks. Focuses on two areas for further consideration by policy makers: diversification; and product quality. |
| DfID/HPAI Research Brief (Epprecht, M. et al)    | Poultry and Poverty in Viet Nam                                                                                                                                                       | 2007        | Description of pre-HPAI conditions in poultry production                                                                                                                                                                                                                                                                                                   |
| DFID/HPAI Research Brief (Pfeiffer, D.U. et al.) | Temporal and Spatial Patterns of HPAI in Viet Nam                                                                                                                                     | 2007        | Describes temporal and spatial patterns of HPAI. Concludes that there was a fairly widespread infection reservoir in Viet Nam, possibly in domestic and wild waterbirds.                                                                                                                                                                                   |
| DFID/HPAI Research Brief (Otte, J. et al)        | HPAI Control Measures and Household Incomes in Viet Nam                                                                                                                               | 2007        | Uses micro-economic data from Viet Nam to prove that control strategies must be designed with poor in mind, rather than considering them part of the problem.                                                                                                                                                                                              |
| Agrifood Consulting International (for FAO)      | The Impact of Avian Influenza on Poultry Sector Restructuring and its Socio-Economic Effects.                                                                                         | 2006        | Using value chain analysis, focuses on semi-commercial producers employing minimal bio-security measures. Main conclusions relate to marginalisation of semi-commercial and traditional poultry producers from previously accessible markets, and failure of restructuring regulations to consider smallholders. Uses primary and secondary data.          |

| <b>Author</b>                                                                                                       | <b>Name of Paper</b>                                                                                             | <b>Date</b> | <b>Relevance to Poverty and Livelihoods</b>                                                                                                                                                                                                                                                                              |
|---------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FAO/PPLPI,<br>(Otte, J)                                                                                             | The Hen which lays the Golden Egg                                                                                | 2006        | Drawing on secondary data, argues that HPAI control measures must take into the account the importance that poultry production plays amongst traditional extensive producers.                                                                                                                                            |
| General<br>Statistics Office,<br>Dept. For<br>Agricultural,<br>Forestry and<br>Fisheries<br>Statistics, Viet<br>Nam | Socio-Economic Impact of Avian Influenza                                                                         | 2004        | Regards all production sectors as a household unit. Findings mostly speculative.                                                                                                                                                                                                                                         |
| Oxfam (GB)                                                                                                          | Gender Analysis in Two Villages in Ninh Thuan Province                                                           | 2004        | In-depth gender analysis. Although poultry is hardly mentioned, useful in providing a wider livelihoods and gender context in one province.                                                                                                                                                                              |
| Vétérinaires<br>Sans Frontières<br>(Delquigny, T et<br>al.)                                                         | Evolution and Impact of Avian Influenza Epidemic and<br>Description of the Avian Production in Viet Nam/ s.????? | 2004        | Provides: stakeholder analysis of poultry sector in relation to HPAI; analysis of how the disease spreads; economic impact assessment. Has some general information on HPAI impact across the 4 production sectors. Draws on primary field data. Much quoted by other sources.                                           |
| Tung, D.X,<br>National<br>Institute of<br>Animal<br>Husbandry, Viet<br>Nam                                          | Smallholder Poultry Production in Viet Nam Marketing<br>Characteristics and Strategies                           | undated     | Describes marketing behaviour of poultry producers and traders. Highlights constraints and suggests strategies for improving marketing channels in the light of HPAI. Draws on primary field data collected through questionnaires, Analyses poultry production systems as subsistence, semi-subsistence and commercial. |
| Vétérinaires<br>Sans Frontières                                                                                     | Free Ranging Ducks and Risks in Avian Flu Disease in Viet Nam                                                    | Undated     | Argues that risky behaviour does not justify radical restructuring of the sector away from traditional practices, which should be carefully assessed.                                                                                                                                                                    |
| <b>Author</b>                                                                                                       | <b>Name of Paper</b>                                                                                             | <b>Date</b> | <b>Relevance to Poverty and Livelihoods</b>                                                                                                                                                                                                                                                                              |
| Phong, L.T et al.                                                                                                   | Resilience of Smallholders: Impact of Avian Influenza on Mixed<br>Farming Systems in the Mekong Delta, Viet Nam. | Undated     | Draws on primary research to show that mixed farming systems are more resilient to HPAI than those that rely solely on poultry production.                                                                                                                                                                               |

| <b>CAMBODIA</b>                                                          |                                                                                                                                                                        |             |                                                                                                                                                                                                                                                                                     |
|--------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Author</b>                                                            | <b>Name of Paper</b>                                                                                                                                                   | <b>Date</b> | <b>Relevance to Poverty and Livelihoods</b>                                                                                                                                                                                                                                         |
| Emerging Infectious Diseases                                             | Interaction Between Humans and Poultry, Rural Cambodia                                                                                                                 | 2007        | Provides the results of a survey on attitudes and behaviour towards HPAI.                                                                                                                                                                                                           |
| FAO (Hickler, B)                                                         | Bridging the Gap Between HPAI "Awareness" and Practice in Cambodia: Recommendations from an Anthropological Participatory Assessment                                   | 2007        | Detailed anthropological study, drawing on primary field data, into behaviour patterns, attitudes and beliefs around poultry disease. Provides concrete recommendations for incorporating these into HPAI communication and awareness campaigns.                                    |
| FAO/MAFF (Cambodia)                                                      | Inception Workshop for the Project "Promotion of Strategies of HPAI Prevention and Control that Support Sustainable Livelihoods and Protect Poultry Breed Biodiversity | 2007        | Some descriptions of Cambodian livelihood strategies in relation to poultry production.                                                                                                                                                                                             |
| CEDAC                                                                    | Gender and Socio-Economic Impacts of Highly Pathogenic Avian Influenza on the Rural Livelihoods of Small Poultry Producers in Cambodia,                                | 2007        | Compares HPAI impact in areas directly in contact with the disease with those where HPAI was not experienced directly. Breaks down groups into poorest, poor, medium and better-off poultry producers.                                                                              |
| <b>Author</b>                                                            | <b>Name of Paper</b>                                                                                                                                                   | <b>Date</b> | <b>Relevance to Poverty and Livelihoods</b>                                                                                                                                                                                                                                         |
| FAO (Agricultural Development International)                             | The Impact of Highly Pathogenic Avian Influenza on the Cambodian Poultry Sector: A Literature Review                                                                   | 2007        | HPAI impact is described from a value chain analysis. Has useful bibliography in annex.                                                                                                                                                                                             |
| The Kingdom of Cambodia, Ministry of Agriculture, Forestry and Fisheries | National Strategy on Highly Pathogenic Avian Influenza.                                                                                                                | 2006        | Describes the situation relating to HPAI in Cambodia and the proposal National Strategy to deal with the pandemic.                                                                                                                                                                  |
| FAO (Vétérinaires Sans Frontières)                                       | Review of the Poultry Production and Assessment of the Socio-Economic Impact of the Highly Pathogenic Avian Influenza Epidemic in Cambodia                             | 2004        | Divides poultry production into backyard and commercial sectors. Also examines all other stakeholders in the value chain, including credit services and consumers. Mainly from an economic perspective. Offers recommendations for protecting and strengthening the poultry sector. |
| World Bank                                                               | A Fair Share for Women: Cambodia Gender Assessment - Chapter                                                                                                           | 2004        | Analysis of gender role differentiation.                                                                                                                                                                                                                                            |

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|-----------------------------------------------------|-----------------------------------------------------------------------------------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                     | 3: Women, Agriculture and Rural Resources.                                        |                    |                                                                                                                                                                                                                                                                                                                                                          |
| Melissa Marschke                                    | Exploring Strategies that Build Livelihood Resilience: A Case From Cambodia.      | (undated)          | Contains useful information relating to livelihoods strategies and coping mechanisms. Also has a bibliography on livelihoods-related literature in general and around Cambodia.                                                                                                                                                                          |
| <b>LAO</b>                                          |                                                                                   |                    |                                                                                                                                                                                                                                                                                                                                                          |
| <b><i>Author</i></b>                                | <b><i>Name of Paper</i></b>                                                       | <b><i>Date</i></b> | <b><i>Relevance to Poverty and Livelihoods</i></b>                                                                                                                                                                                                                                                                                                       |
| FAO                                                 | Managing Risk and Developing Options: HPAI and Livelihood Linkages in the Lao PDR | 2008               | Drawing on primary field data, examines livelihoods in relation to poultry production. Aim is to contribute towards measures that will support local livelihoods whilst minimizing HPAI risk. Divides production systems into: intensive; semi-intensive; and extensive. Divides producer households into very poor; medium poor; medium rich; and rich. |
| Emerging Infectious Diseases (Letter to the Editor) | Avian Influenza Risk Perceptions, Laos.                                           | 2007               | Summary of the results of primary field data into HPAI knowledge and awareness amongst rural, peri-urban and urban populations.                                                                                                                                                                                                                          |

| <b>INDONESIA</b>                              |                                                                                                                                                                                                                                  |                    |                                                                                                                                                                                                                                                                                                                                                    |
|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b><i>Author</i></b>                          | <b><i>Name of Paper</i></b>                                                                                                                                                                                                      | <b><i>Date</i></b> | <b><i>Relevance to Poverty and Livelihoods</i></b>                                                                                                                                                                                                                                                                                                 |
| FAO (McLeod, A; Morgan, N)                    | Mission to Jakarta and Bogor, Planning process for organising a study: "Livelihood and gender impact of rapid changes to poultry biosecurity policy in the Jakarta area and lessons learned for future approaches in urban areas | 2007               | Examines the story so far and suggests next steps.                                                                                                                                                                                                                                                                                                 |
| <b><i>Author</i></b>                          | <b><i>Name of Paper</i></b>                                                                                                                                                                                                      | <b><i>Date</i></b> | <b><i>Relevance to Poverty and Livelihoods</i></b>                                                                                                                                                                                                                                                                                                 |
| FAO                                           | Livelihood and Gender Impact of Rapid Changes to Bio-Security Policy in the Jakarta Area and Lessons Learned for Future Approaches in Urban Area.                                                                                | 2007               | Using primary field data as well as secondary data, reviews the impact of the poultry production ban in Jakarta Province on livelihoods of people who depend on poultry for their livelihoods. Provides recommendations for incorporating livelihoods concerns into control measures. Categorises poultry producers into chicken and duck raisers. |
| FAO (Denpasar)                                | The Bali Poultry Market Chain                                                                                                                                                                                                    | 2007               | Analysis of the Bali poultry market chain, indicating the greatest risk areas for HPAI infection. Some information about producer HPAI-related attitudes and behaviour.                                                                                                                                                                            |
| FAO                                           | Poultry Market Chain Study in North Sumatra                                                                                                                                                                                      | 2007               | Market chain analysis to highlight the greatest HPAI-related risk areas. Some information around HPAI awareness and risky behaviour.                                                                                                                                                                                                               |
| <b>THAILAND</b>                               |                                                                                                                                                                                                                                  |                    |                                                                                                                                                                                                                                                                                                                                                    |
| <b><i>Author</i></b>                          | <b><i>Name of Paper</i></b>                                                                                                                                                                                                      | <b><i>Date</i></b> | <b><i>Relevance to Poverty and Livelihoods</i></b>                                                                                                                                                                                                                                                                                                 |
| Viroj NaRanong, Thailand Development Research | Structural Changes in Thailand's Poultry Sector and its Social Implications.                                                                                                                                                     | (Undated)          | Describes the poultry industry and the drivers of the sector. Focuses on structural changes and social implications, especially on smallholders, who were the subject of a telephone survey.                                                                                                                                                       |

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|----------------------------------|-------------------------------------------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Institute:                       |                                                 |           |                                                                                                                                                                                                              |
| Ratchathani University, Thailand | Village Chicken Production Systems in Thailand. | (Undated) | Describes the production system of traditional indigenous chickens. Substantial information on social uses of chickens, such as gifts, offerings, ceremonies. Uses traditional producer as unit of analysis. |

| <b>TURKEY</b>          |                                                                                   |             |                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------|-----------------------------------------------------------------------------------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Author</b>          | <b>Name of Paper</b>                                                              | <b>Date</b> | <b>Relevance to Poverty and Livelihoods</b>                                                                                                                                                                                                                                                                                                                                                                                        |
| FAO (Geerlings, E)     | Rapid Assessment of HPAI Socio-Economic Impacts in Turkey                         | 2006        | Uses primary field data to assess HPAI impact on backyard poultry producers. Aim is to support effective HPAI strategies and mitigate negative effects. Uses a livelihoods-influenced lens.                                                                                                                                                                                                                                        |
| <b>EGYPT</b>           |                                                                                   |             |                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| FAO                    | Interventions for Improving Biosecurity of Smallscale Poultry Production in Egypt | 2007        | Describes local poultry sectors in order to identify affordable interventions for increasing biosecurity of smallscale producers. In-depth analysis of backyard and smallscale farm biosecurity practices. Provides recommendations for achieving affordable interventions. Some differentiation within sectors by poverty status, but mostly focuses on production sectors. Draws on primary field data as well as secondary data |
| WFP/FAO (Geerlings, E) | Rapid Assessment of HPAI Socio-Economic Impacts in Egypt                          | 2007        | Assesses traditional poultry systems of backyard/rooftop vulnerable households from a livelihoods perspective. Focuses on HPAI impact on women. Divides producers into very poor, poor and medium poor. Uses primary field data.                                                                                                                                                                                                   |
| UN ICEF                | Avian Influenza Survey:                                                           | 2007        | Examines knowledge, attitudes and practices of Egyptian Public. Draws on primary field data collected amongst females from the age of 15 upwards – a particularly vulnerable group. Concludes that despite high HPAI knowledge and awareness of risk reduction strategies, risky behaviour is still practised.                                                                                                                     |



| <b>NIGERIA</b>          |                                                                          |             |                                                                                                                                                                                                                                                                                                                                                         |
|-------------------------|--------------------------------------------------------------------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Author</i>           | <i>Name of Paper</i>                                                     | <i>Date</i> | <i>Relevance to Poverty and Livelihoods</i>                                                                                                                                                                                                                                                                                                             |
| UNDP                    | Socio-Economic Impact of Avian Influenza in Nigeria                      | 2006        | Includes some rural / urban analysis and analysis on non-producers such as workers, traders, feed millers. Distinguishes between poor and medium poor. Draws on primary field data in HPAI-affected and non-affected states. Uses FAO's 4-sector categorisation of production systems, except the other way round (i.e. sector 1 = backyard producers). |
| <b>ETHIOPIA</b>         |                                                                          |             |                                                                                                                                                                                                                                                                                                                                                         |
| <i>Author</i>           | <i>Name of Paper</i>                                                     | <i>Date</i> | <i>Relevance to Poverty and Livelihoods</i>                                                                                                                                                                                                                                                                                                             |
| FAO (Bush, J)           | The Threat of Avian Flu, Predicted Impacts on Rural Livelihoods in SNNPR | 2006        | Livelihoods and poverty-centred analysis of potential HPAI impact on food and income security of poultry producers. Provides recommendations for protecting the livelihoods of the poor in the event of an HPAI outbreak.                                                                                                                               |
| <b>AFRICA (GENERAL)</b> |                                                                          |             |                                                                                                                                                                                                                                                                                                                                                         |
| Guèye, E.F              | Evaluation of the Impact of HPAI on Family Poultry Production in Africa  | 2007        | Provides an overview of the potential impact. Includes summary of multiple roles of poultry.                                                                                                                                                                                                                                                            |
| Sonaiya, E.B:           | Family Poultry, Food Security and the impact of HPAI                     | 2007        | Summarises global themes around family poultry and HPAI in relation to Africa.                                                                                                                                                                                                                                                                          |