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## Key Findings

- More than two-thirds of all poultry producers in Ethiopia are in Oromiya, Amahara, SNNPR, and Addis Ababa, the key regions to target for HPAI prevention and surveillance.
- Small-scale poultry producers have diversified livelihoods and livestock portfolios and therefore are likely to be resilient against HPAI shocks.
- “Larger” small-scale poultry producers stand to lose about half of their livestock wealth as a result of HPAI shocks. Such asset depletion is expected to have detrimental impacts on the sustainability of livelihoods.

## Controlling Avian Flu and Protecting People’s Livelihoods in Africa and Indonesia

HPAI Research Brief | No. 12 – Year: 2009

## Investigating the Role of Poultry in Livelihoods and the Impact of HPAI in Ethiopia

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**Ethiopia** supports one of the largest livestock populations in all of Africa (Alemu et al. 2008). In fact, the livestock sector accounts for 19 percent of national GDP, and as much as 40 percent of agricultural GDP (FAO 2004). At a micro level, it has been estimated that livestock supports the livelihoods of about 80 percent of the rural population (FAO 2004). Almost all (94 percent) of the country’s 34 million poultry population comprises indigenous birds, revealing that the poultry subsector is characterized by small-scale household-level poultry (Central Statistical Agency (CSA) 2005; Alemu et al. 2008).

As in other African countries, small-scale household-level poultry (also known as backyard or village-level poultry) in Ethiopia is defined as having low feed input (primarily scavenging), low input of veterinary services, almost no investment in housing and hence minimal level of biosecurity, high off-take rates, and high mortality rates. This system does not involve investments beyond the cost of the foundation stock, a few handfuls of local grains, and possibly simple night shades or night time housing in the family dwellings (Alemu et al. 2008). However, the poultry sector currently is emerging as a dynamic livestock subsector due to increasing demand for poultry products and eggs in major urban centers.

A handful of studies have investigated the role of household-level poultry keeping in livelihoods. These studies are mainly based on qualitative or quantitative data generated through rapid assessment techniques. These studies show that similarly to other African countries, small-scale backyard or village level poultry contributes to various livelihoods outcomes in Ethiopia, including gender equality and cash income, in addition to its role in cultural, religious, and traditional practices (Kitalyi 1998; Tadelle and Ogle 2001; Tadelle et al. 2003; Bush 2006).

While Ethiopia has never had an outbreak of the highly pathogenic avian influenza (HPAI), there was a scare in 2006. This scare caused a massive demand shock that led to a sharp decline in poultry prices (Alemu et al. 2008). Bush (2006) reports that this shock was particularly severe in urban areas, where poultry demand decreased by 25 to 30 percent. As a result of the reduction in urban demand and the subsequent oversupply, poultry prices dropped by 50 to 60 percent, though this plunge was short-lived.

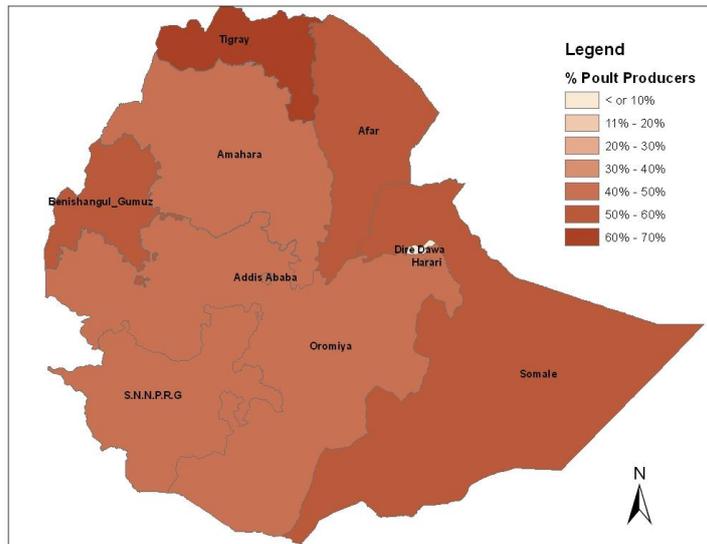
This brief summarizes a study that (i) investigated factors that affect participation in small-scale poultry production and profiled those households most likely to be poultry producers and those most likely to keep larger flocks, and (ii) assessed the potential impact of HPAI supply and demand shocks on a livelihood outcome, namely, livestock wealth. Such information is expected to assist in the design of efficient, effective, and equitable interventions for the control and mitigation of potential HPAI outbreaks and associated shocks. The study used data from the most recent nationally representative Household Income, Consumption and Expenditure (HICE 2004-2005) and econometric models.

## Poultry Producing Households in Ethiopia

According to the HICE data, 44 percent of Ethiopian households keep poultry. In terms of regional distribution, almost a quarter (23 percent) of all poultry keepers are in the Oromiya region. This is followed by Amahara (18 percent), SNNPR (14 percent), and Addis Ababa (13 percent). Less than one percent of Ethiopian poultry producing households are in Dire Dawa. In terms of their rural or urban location, 50 percent of all households in rural areas and 43 percent of all households in urban areas keep poultry, revealing that household-level poultry production is an equally popular livelihoods activity in both areas. Within regions, Tigray has the highest percentage of households keeping poultry (66 percent), followed by Afar (60 percent) and Somale and Benishangul (54 percent). The region with the smallest proportion of poultry keeping households is Dire Dawa (11 percent). Figure 1 presents the proportion of households that keep poultry across regions of Ethiopia, based on the HICE data.

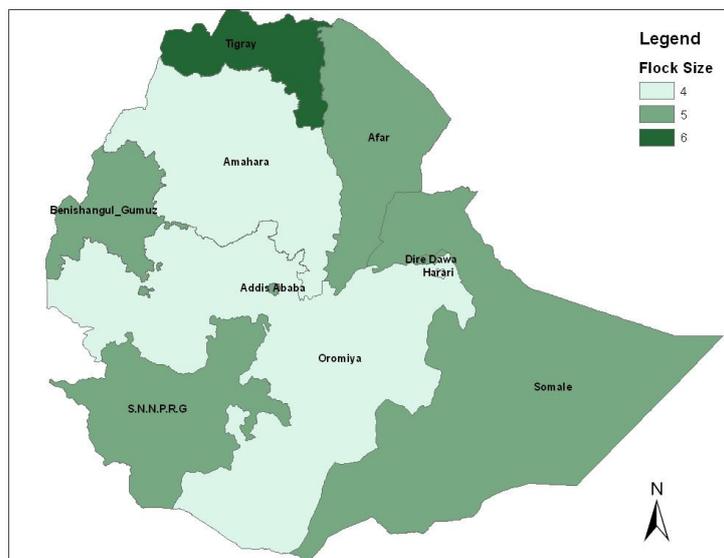
The average flock size managed by poultry producing households is small (5 birds). Poultry producing households in Tigray manage the largest flocks with 6 birds, followed by those in Somale with 5.4 birds. Poultry producing households in Harari manage the smallest flocks, with 4.2 birds. Figure 2 presents the distribution of average poultry flock sizes in each region, based on the nationally representative HICE data.

**Figure 1. Small-scale poultry production, by region**



Source: HICE

**Figure 2. Average small-scale poultry flock sizes, by region**



Source: HICE

Two probabilistic models were used to determine the household, agro-ecological, farm, and market level factors that affect (i) a household’s decision to engage in poultry production as a livelihoods strategy, and (ii) a household’s decision regarding the size of flock to manage.

The first model shows that predicted poultry keepers have significantly less educated household heads, larger households, fewer adult females, and higher levels of livestock wealth (i.e, value of livestock owned). There are, however, no significant differences between predicted keepers and non-keepers’ household income per capita levels and poverty status (poverty line or food [core] poverty

line). Although predicted poultry keepers have fewer household members with off-farm employment, they have more diversified livelihoods strategies, as measured by the number of different income sources. Compared to predicted non-keepers, a significantly greater proportion of predicted poultry keepers are engaged in production of other livestock including small livestock, cattle, plough animals, and pack animals. In other words, predicted poultry keepers have diversified livelihoods as well as livestock portfolios.

The results of the second model show that households predicted to keep larger flocks have older and less educated household heads, are larger, and have higher numbers of children, though fewer adult females. Households with larger flocks also have higher levels of livestock wealth, though there are no significant differences between the income, poverty, and core poverty status of households predicted to keep larger flocks versus those predicted to keep smaller flocks. Households predicted to keep larger flocks have fewer household members with off-farm employment; however they have more diversified livelihoods portfolios and are significantly more likely to be engaged in the production of other livestock.

## HPAI Scenarios

To estimate the impact of HPAI on poultry-producing households' livestock asset wealth (as a livelihoods outcome), six artificial counterfactual scenarios were created and investigated. The method of analysis involved matching households in the treatment and control groups for the scenarios described in Table 1.

**Table 1. Description of HPAI scenarios for poultry-keeping at the household level**

	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5*	Scenario 6*
Description of simulated impact	100% loss of flock	100% loss of small-scale flock	75% loss of large-scale flock	50% reduction in price	100% loss of flock in high-risk areas	75% loss in large-scale flock in medium-risk areas
Treatment group	All households without poultry	All households without poultry	Small-scale poultry keepers (1-2 birds)	Poultry keepers who sold at low prices	All households without poultry	Small-scale poultry keepers (1-2 birds)
Control group	All households with poultry	Small-scale poultry keepers (1-2 birds)	Large-scale poultry keepers (>2 birds)	Poultry keepers who sold at high prices	All households with poultry	Large-scale poultry keepers (>2 birds)
*For scenarios 5 and 6, Ethiopia disease spread maps from Stevens et al. (2009) were used to allocate regions into high and medium HPAI spread risk areas. According to this map, Benishangul, Northern parts of Oromiya, Addis Ababa, Tigray, and Amahara are high HPAI risk areas while southern parts of Oromiya, SNNPR, Somale, and Dire Dawa are generally medium risk areas.						

In each scenario, statistical methods were used to compare the livelihoods outcomes of a treatment group of households, which represents the result of the HPAI demand or supply shocks, and a control group representing the status quo (if no HPAI shocks occurred). The household groups were matched according to various household-level characteristics (e.g., household demographics, assets, regional characteristics such as location, poverty status, number of income sources, etc.) which are expected to affect household's propensity to be in the treatment situation as well as their outcomes (livestock

wealth). According to this method of matching, the two groups should differ only in terms of their poultry ownership characteristics.

## Impacts of HPAI on Poultry Producing Households’ Livelihoods

Table 2 presents the results of the differences between the livelihoods outcomes of control and treatment households.

**Table 2. Estimated impact of HPAI on the livelihoods outcomes of household-level poultry producers in Ethiopian Birr (ETB) (standard deviations)**

	1 – All Ethiopia: Lose all poultry	2 – All Ethiopia: Small flocks lose everything	3 – All Ethiopia: Large flocks become small flocks	4 – Poultry sellers in Ethiopia: High price falls to low price	5 – High HPAI risk: Lose all poultry	6 – Medium HPAI risk: Large flocks become small flocks
<b>Total wealth from livestock</b>	<sup>a</sup>	-	<b>-756.2***</b> <b>(290.9)</b>	-	-	<b>-988.3*</b> <b>(547.6)</b>

<sup>a</sup> - indicates insignificant estimated impact; \*\*\* Significantly different outcomes between the two groups at the 1 percent and \*10 percent significance levels

In the HICE data, the only poultry-related outcome variable available is wealth from livestock; therefore, livestock wealth is the livelihoods outcome variable of focus. The results reveal that HPAI may cause significant reductions in wealth from livestock under scenarios 3 and 6. According to scenario 3, if an average poultry producing household that manages a “larger” small-scale flock lost 75 percent of its flock due to HPAI, its total livestock wealth would decrease by 756ETB (US\$67), from its pre-HPAI average annual livestock income of 1,493ETB (US\$132). This represents a 51 percent reduction. According to scenario 6, if “larger” small-scale poultry producers in medium HPAI risk areas lost 75 percent of their flock due to HPAI, their total livestock wealth would decrease by 988ETB (US\$88) from their pre-HPAI average livestock wealth of 3,155ETB (US\$280), thereby resulting in a 31 percent decrease in wealth from livestock.

## Concluding Remarks

Statistical analyses conducted on the nationally representative HICE data reveal that almost half (44 percent) of all Ethiopian households keep poultry. This figure is significantly higher for rural Ethiopians (at 50 percent), though a significantly large proportion of urban Ethiopians also keep poultry (43 percent), revealing that in Ethiopia poultry keeping is not necessarily only a rural phenomenon. More than two-thirds of all poultry producers in the country are located in four regions: Oromiya, Amahara, SNNPR, and Addis Ababa. Therefore, these regions (and both rural and urban areas therein) would comprise the key ones to target for HPAI prevention and surveillance.

The results also reveal that poultry producers have diversified income sources. They are likely to produce all other types of livestock as well as engage in other income generating activities, such as crop production. Therefore, predicted poultry producers are likely to be resilient against various shocks and stresses, such as those that may be caused by HPAI. This is especially true in the case of

HPAI-related demand and supply shocks which are unlikely to have negative impacts on demand for and supply of other livestock.

Finally, the impact assessment of HPAI on livestock wealth status of poultry producers reveals that “larger” small-scale poultry producing households are most vulnerable to HPAI in terms of livestock wealth (asset value) loss, as they stand to lose significant proportions of their livestock wealth. It should be noted, however, that the “large” scale poultry producers included all those with more than two birds, and the average flock size of these “larger” producers is still small with seven birds. Given the magnitude of loss in assets for the poultry producing households with “larger” small-scale flocks, targeted intervention measures should be in place to encourage the adoption of HPAI mitigation measures, and households with “larger” flocks should be given special focus when designing compensation policies. Policy measures to support capacity building and create incentives for investment in poultry production, especially in biosecurity, are of fundamental importance for the strengthening of the small-scale poultry sector against shocks such as HPAI.

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