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Key Findings

- Information on the smallholder poultry sector is extremely limited.
- Smallholders produce poultry as an ancillary activity, and have little bargaining power in higher value urban markets.
- Chinese poultry products are ubiquitous in Northern Lao PDR, and signal that there are large inflows of Chinese poultry.

Controlling Avian Flu and Protecting People's Livelihoods in the Mekong Region

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Assessment of Smallholder Indigenous Poultry Producer Viability After HPAI in Lao PDR

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Smallholder indigenous poultry production is ubiquitous in Lao PDR and represents a crucial income generating opportunity for one of the poorest countries in the Greater Mekong Subregion (GMS). Much like other countries in the GMS, highly pathogenic avian influenza (HPAI) outbreaks and the related control measures have adversely affected smallholder production. Despite the importance and prevalence of smallholder poultry production in Lao PDR, information and data on the sector is limited. This information gap creates a serious burden to the effective monitoring and control of HPAI, as a regionally coordinated effort is needed. Furthermore, people's livelihoods are at stake and an in-depth understanding of the smallholder poultry sector is necessary to insure control policies do not adversely affect production. Survey work conducted in Lao PDR aims support evidence-based solutions to these problems. Questionnaires consisted of two distinct parts covering the actors in the supply chain that supply poultry products and the urban consumers of those good.

Background

More than 94% of all agriculture output exists in a traditional smallholder system with limited inputs and over 90% of households keep at least one species for bird. Production systems are dominated by the traditional, smallscale, extensive model accounting for an estimated 84% of the national poultry flock. This system is common throughout the country in both urban and rural areas, and is especially favoured amongst the poor due to its low inputs. In this system birds scavenge for food during the day and sleep at night in trees, underneath houses, in natural sheds, or in rudimentary enclosures. Therefore the costs of inputs are extremely low and are often only the small cash expense for day old chicks (DOCs) and feed. However, once birds become mature there is no need to purchase DOCs because they can be self-supplied through hatchlings and

thus the system is self-replacing. Flock sizes are typically small (under 100 birds), and different bird species are raised in conjunction with each other. The majority of smallscale poultry production is intended for household consumption and only after satisfying family nutrition requirements are birds sold or given as gifts. When sales do occur, producers face a variety of options. First, they can simply sell their product themselves in affect acting as a vendor. This commonly occurs if the producer regularly operates as a vendor or if they sell products to neighbours. Secondly, a producer may sell their products to vendors directly in the market. This often requires a pre-established relationship or agreement with the vendor, although in some cases producers may bring birds to the market with no pre-arranged sale in place. Finally, a producer can sell their products to a trader or aggregator. Aggregators rely on networks within different villages and buy birds from numerous farmers and then transport the birds to the market where they are either sold directly to consumers or to vendors.

Semi-intensive production systems are often lumped into traditional backyard systems, but with flock sizes of 50 to 1,000 birds and intensive qualities it should be considered a unique production system. Semi-intensive production accounts for an estimated 11% of Lao PDR's poultry population. Housing is provided for birds either in permanent or makeshift enclosures, with both feed and water being provided in plates, trays, and/or bowls. The level of intensiveness can vary widely and often gardens, backyards, or vacant pieces of land are fenced-in to house birds at night after scavenging for feed during the day. Bio-security measures, albeit limited, represent another key difference between traditional backyard systems as sanitation, treatment, and management are given more priority to limit disease outbreaks. Birds are more frequently sourced from external channels, although the majority of restocking remains self-replacing from the flock. Production is usually focused on poultry meat or eggs. Compared to traditional backyard production systems, these outputs have higher rates of marketing and more formal marketing channels.

While the lines are often blurred between traditional and semi-intensive production, intensive production demonstrates a clear divide between poultry production systems. Intensive production operations generally have flocks of 1,000 to 10,000 birds and account for approximately 5% of the national poultry population. These operations are characterized by advanced production infrastructures designed for commercialization that includes elaborate housing, feeding and drinking systems. Many of these farms have contracts with CP, a large Thai conglomerate, and source energy dense commercial feed and replacement chicks directly from Thailand.

The HPAI epidemic in Lao PDR was extremely limited relative to other countries in the GMS due to a variety of factors. First, the poultry sector is far less developed and poultry populations are small compared to neighboring countries. Furthermore, the general remoteness of many villages in the country means that trade and interaction between poultry is restricted. Finally, national veterinary services are poorly funded resulting in low monitoring and awareness levels. As a result, HPAI is not perceived as a risky disease for birds and humans and there is a wide acceptance of high seasonal poultry deaths. These facts have likely masked the real number and geographical extent of outbreaks that took place.

The Vientiane Capital and Province were the most common sites of the HPAI outbreaks with 8 of the reported 19 events. This should come as no surprise, as the Vientiane province has large amounts of poultry (and commercial operations) and reporting in the area is likely much better given the close proximity to the central government. Commercial farms were initially the most frequent to report infections and resulted in significant stock losses. In total, commercial producers lost as much as 20% of the national layer flock and almost 40% of the layer flock in the Vientiane province alone. However, since 2008 the majority of outbreaks have occurred in the far north of Lao PDR in the provinces of Luang Namtha, Oudomxay, and Phongsali. The fact that HPAI has been appearing in the north of Lao PDR is off particular interest because it brings up the issue of transboundary risk.

Luang Namtha and Phongsali are sparsely populated with small poultry populations and densities and it is suspicious that the disease would appear here. Although Oudomxay has a more developed poultry sector (albeit still relatively small), the fact that it is the trade hub of northern Lao PDR is of greater interest. There is a large Chinese presence in Oudomxay and many businesses are owned and operated by Chinese. In the markets, many vendors are Chinese as well and Mandarin is commonly heard. Clearly there are strong linkages with China in the north, and it appears likely that cross-border trade of poultry products between the two countries can explain the high incidence of HPAI in this region.

Adding further relevance to the transboundary risk issue is that the Dien Bien Phu province in Viet Nam has been home to numerous HPAI outbreaks including recent events in November 2009 and January 2010. Dien Bien Phu is adjacent to Lao PDR and the city center is only 36 kilometers from the border, which has tremendous implications for Lao PDR. The isolation of Dien Bien Phu and far proximity to other outbreak areas has fueled suspicion that cross-border poultry trade may be responsible for the high HPAI activity. It appears possible that trade from China, through Lao PDR and into Viet Nam may explain the abnormal levels of HPAI activity in the province.

Project Activities

Questionnaires were implemented in the northern, central, and southern parts of the country, spanning three distinct geographical regions. Survey implementation began in the central part of the country in the Vientiane Capital province from December 2009 to February 2010. Next, questionnaires were conducted in the north in the Oudomxay, Luang Namtha, and Phongsali provinces in February and March. Finally, the project was concluded in the south with surveys conducted in the Savannakhet province in May and April. Villages were selected using a rigorous sampling methodology with 128 selected in Vientiane, 60 in the North, and 64 in Savannakhet.

Figure 1: Map of Vientiane Capital Province Survey Locations

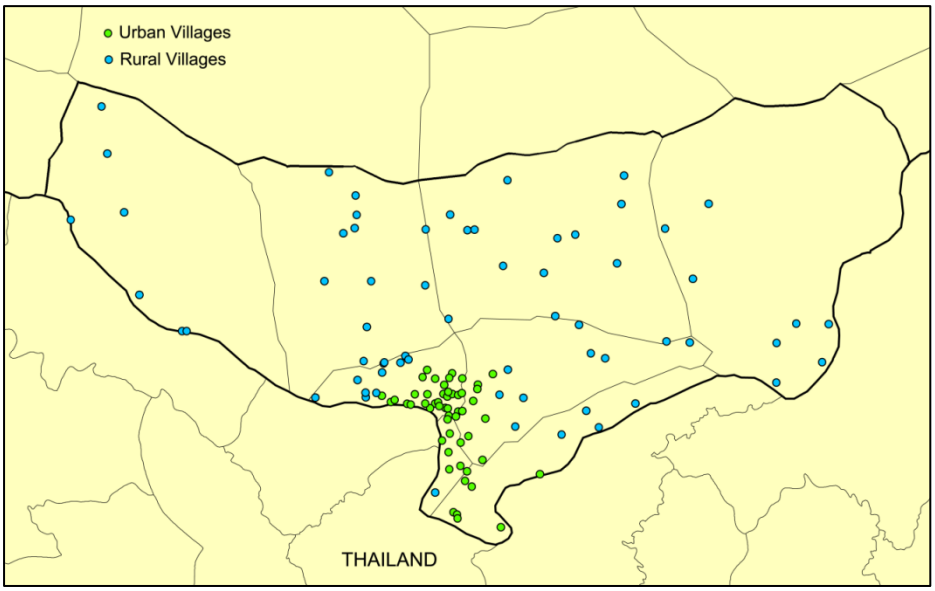


Figure 2: Map of Northern Lao PDR Survey Locations

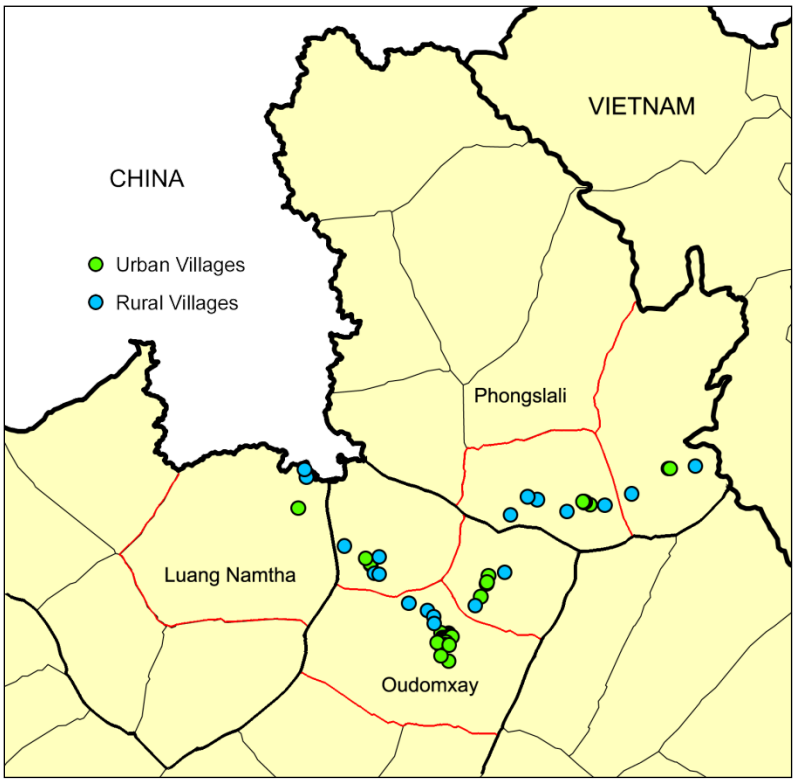
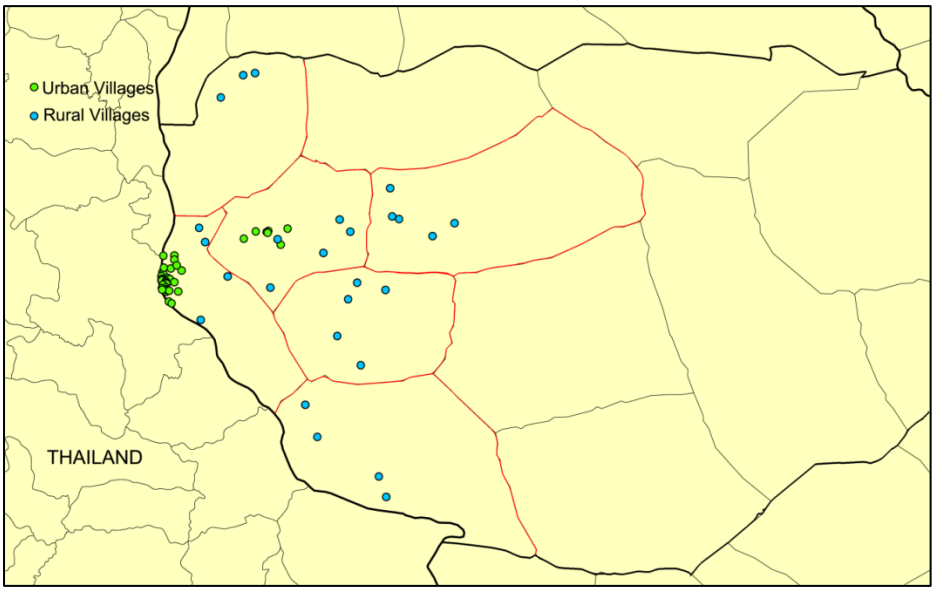


Figure 3: Map of Savannakhet Survey Locations



Poultry farmer surveys consist of three distinct questionnaires: a smallholder chicken and duck producer questionnaire, a largescale chicken producer questionnaire, and a largescale duck questionnaire. The largescale questionnaires are intended for households that raise more than 100 birds and are applicable for both meat and egg producers. Additionally aggregator and market vendors were surveyed as well providing a supply chain audit that demonstrates how poultry products are marketed.

Consumer surveys were only implemented in urban villages in provincial or rural capitals. The purpose of the Consumer Survey is to better understand poultry purchasing habits of households that acquire their poultry products through markets (i.e., do not raise their own poultry). A detailed survey was conducted revolving around household tastes, price sensitivity, breed preference, and other aspects of shopping habits.

In total, 4,266 observations were recorded. Slightly under half of these come from Vientiane where a larger amount of smallscale and consumer observations were recorded as survey work was done in conjunction a Phingseng Channgakham at the National University of Lao PDR. The other two regions account for approximately 1,000 observations each split between 500 market chain and 500 consumer observations.

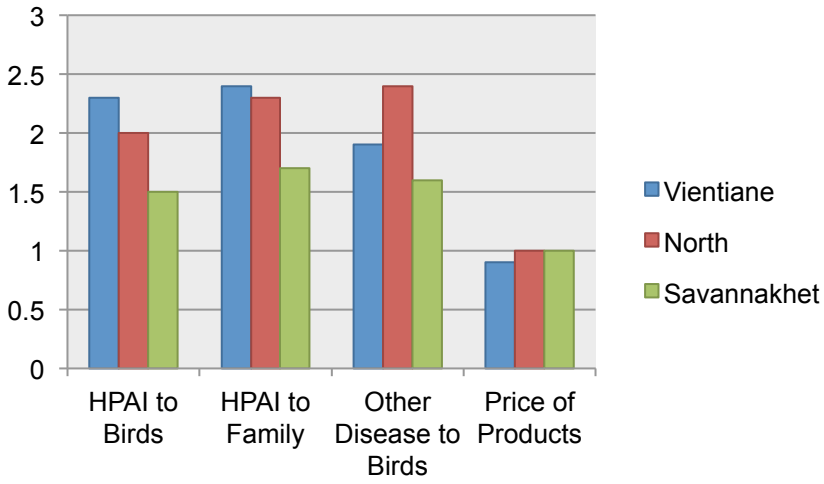
Table 1: Project Totals

	Smallscale	Large Chicken	Large Duck	Aggregator	Market Vendor	Consumer Household	Total
Vientiane	1,047	81	29	27	99	782	2,065
North	421	9	3	41	45	520	1,039
Savannakhet	508	28	3	36	45	502	1,112
Total	1,976	118	35	104	189	1,804	4,226

Findings and Outcomes

Smallscale survey data reveals that poultry production is primarily an ancillary activity as most households raise crops and produce other livestock. We find the primary purpose of poultry production for smallholders is to consume, or to consume and sell. Flock sizes range from 37 to 42 birds depending on region and we see that chickens are the preferred species and some smallscale producers may raise ducks as well, but often in much smaller quantities. Looking at inputs, we find that self-replication and sourcing from other farmers satisfy virtually all the needs for new bird inputs into smallscale flocks. While aggregators play a large role in the marketing of poultry, they are much less important actors in the supply of inputs on smallscale farms. Feed is the most common and expensive cost for smallscale producers and they spend $17 to $23 USD on feed per month. In regards to sales, 42% to 66% of producers reported selling birds in the past year, however the frequency of sales is very limited and almost all producers reported selling birds less than once a month. Our data demonstrates the large role aggregators have in the smallholder supply chain as they were the most common channel producers sold to. We find that on average, producers earn between approximately $6.14 USD to $7.80 USD per month from poultry sales. Biosecurity measures are limited overall, but most smallscale producers reported they clean their bird enclosures regularly. In terms of HPAI, Vientiane and the North were home to the most farmers that had birds culled in response to HPAI outbreaks with 14.9% and 13.2% of farmers having birds culled respectively. We find that for all smallscale farmers HPAI affecting their family was of larger concern than HPAI affecting their flocks, and in general farmers are more concerned with disease than the price of their products.

Figure 4: Smallscale Farmer Disease Concerns



Large producers were more likely to source from hatcheries or companies, but overall sourcing from their own flock was still the most common source of chicks or ducklings. Large producers seek veterinary services more frequently than small producers, which is logical given their larger flock sizes and commercially oriented production. Increased veterinary services along with

employees and electricity are all common costs for large producers which we do not see as frequently for small producers. For producers with flock sizes under 500 we find that feed is the largest monthly cost followed by transportation of products and bird health related costs. We find that producers with flock sizes over 500 birds have both a larger variety of costs and significantly higher costs due to several industrial farms that are included in this category. Just like smallscale producers we find that the majority of sales go through aggregators. There is a great variation in sales between months for meat because birds are raised in batches, and are therefore sold in large, infrequent quantities (ranging from 2 to 728 birds sold per month). Large producers take more biosecurity measures than small producers, especially in the North and in Vientiane. Vientiane was home to the largest percentage of producers with culled birds with 10% of chicken and 17.2% of duck producers reporting losses.

For aggregators, local birds, and specifically chicken, were the most commonly traded product and overall chickens are traded more frequently than duck. Aggregators primarily source products from smallscale farmers and sourcing from large farms was rare and only encountered from aggregators in the North. However, our largescale observations show that aggregators are the largest marketing channel for large producers, and therefore these aggregators were missed in our sample. We find that gasoline is the most common cost, and gasoline and transportation rental were the largest costs. The data reveals that broilers are the primary product traded among aggregators especially in the North where trader's only reported selling broilers birds. Layers, males for breeding, and chicks were all much less common and their quantities were far below those of broilers. In regards to quantities, our data demonstrates the strong seasonal characteristic of poultry sales, especially for broilers. This is because poultry meat is an important food source during festivals and holidays and aggregators meet the increased demand by purchasing and selling larger quantities. We also find that aggregators trade larger volumes of chickens than ducks. Looking at broiler pricing data we find that aggregators earn approximately $0.41 to $0.52 per kilogram sold or $0.52 to $1.08 per bird sold. Aggregators sell to a variety of sources, and there are large differences between regions. For all aggregator's market vendor sales are the largest marketing channel, particularly for aggregators in Vientiane. Direct sales to consumers are also high in Vientiane, but are largest in the North where over a third of all sales go to end users. In Savannakhet, aggregators sell primarily to market vendors and then a mixture between consumers, restaurants and shops, other traders, and poultry farmers. Aggregators present a huge potential for transboundary risk, but the majority of aggregators our enumerators encountered in the North did not trade foreign poultry products. However, traders of foreign poultry products tend to be nationals of the foreign countries and therefore our enumerators could not interview these individuals because of possible language or social barriers.

Vendors in Vientiane most frequently sold commercial chickens, followed by local chickens. In other regions, local birds were the most common product sold, although commercial chickens were sold by over a quarter of producers in the North and Savannakhet. Across all regions chicken vendors were more common than duck vendors. Looking at the source of poultry products for market vendors, again the importance of aggregators in the supply chain can be

seen. Aggregators are the most important source of inputs for vendors across all regions, where birds are either purchased at the market or are delivered to the vendor's home. Outside of Vientiane, sourcing from a farm was more common, and was more common for duck purchases than chicken purchases. Nearly a third of vendors in the North reported buying products from neighboring countries. It is likely that the actual number is much higher than this, as many vendors in Northern markets are Chinese and only speak Mandarin, and were thus not interviewed. The most common products bought for sales were eggs, followed by slaughtered birds. Because of the stigma attached to Chinese poultry products enumerators also asked vendors how common Chinese products were with among other vendors at the same market. Only 1 vendor reported they had not seen Chinese products in their market, while 63% said Chinese products were very common. Just as our other data illustrates, Chinese eggs are the most widespread followed by slaughtered and live birds.

For consumers, we find that across the country most households spend approximately $40 on food per month. Chicken meat expenses were largest in Vientiane, where households spent $4.76 USD per month on average or 15% of the total amount spent on food to be prepared in the home. Duck meat expenses were largest for northern households, spending $3.35 USD per month or 12% of the total amount spent on food to be prepared in the home. Duck egg expenses were also largest in the North, while Chicken egg expenses were largest in Savannakhet. Chicken meat was the most frequent meat purchase among consumers, where the majority purchase birds weekly. In Vientiane and Savannakhet, we find that the majority of households do not in fact purchase duck meat at all. Households that do purchase duck meat in these regions, either purchase primarily for special occasions (Vientiane) or on a weekly basis (Savannakhet). Poultry meat purchasing is the lowest overall in Savannakhet where nearly 20% of households do not purchase any poultry meat all. Consumers prefer local birds to commercial birds, especially for duck meat. Live birds are most commonly purchased in the north, while slaughtered bird purchases are more frequent in Vientiane and Savannakhet. Across all regions, safety was identified as the most important attribute when purchasing poultry, followed by taste and price. Overall consumers express that they are extremely concerned about disease risk and the safety of their meat, which is why over 80% of households said they would be interested in purchasing birds from a certification program that ensures healthy birds. For Northern households, almost 60% reported purchasing Chinese eggs, however nearly all consumers said they had seen Chinese eggs in their local market.

Policy Recommendations

The current state of the smallholder production model is not as efficient as it could be, limiting much-needed potential revenue to producers. The lack of enforceable contracts or product certifications leads to problems of moral hazard and adverse selection. Smallholder producers have no incentive to invest in higher quality or disease free birds because there are no mechanisms to signal their product is of higher value. Furthermore, vendors that purchase birds through traders have no way of evaluating the health or quality of the product other than

superficial means or trusting the aggregator. These information failures have negative impacts on animal health as well, because weak incentives compromise biosecurity leading to potentially seriously escalations of disease risk. Most solutions to these problems produce inadequate results. Simply enforcing formal systems, such as health certification or vaccine programs, often leads to fraud or concealment and may only further complicate the issue. Another option is to create formal markets, but this too has its drawbacks. Formal marketing channels, such as those used by industrial producers, have increased transaction costs and are often not viable for smallholder producers as their margins are so low.

Micro-contracts, certification systems, and smallscale producer cooperatives are just come of the opportunities to solve these information and market failures. However, the real challenge remains to demonstrate to smallholders that their birds and a valuable investment and worth the added trouble of entering more formal channels for marketing. For most producers, we see that poultry production is an ancillary activity and encouraging smallholders to increase product quality and safety remains a large hurdle.

In regards to HPAI, although outbreaks in Lao PDR have been minimal compared to other neighboring countries, the control of the disease is a regional issue and therefore Lao PDR has an important role to play. Transboundary risk and cross-border trade are of particular relevance, especially in northern Lao PDR where trade with China appears to be responsible for recent HPAI outbreaks. Our survey data demonstrates that Chinese poultry products are ubiquitous in the North, and despite official bans the boarder remains porous. Rather than attempt to restrict border crossings, neighboring countries must acknowledge that the trade exists and cooperate to monitor it in the open. Simply trying to close borders is an unsuitable solution because the borders are so penetrable that this approach is ineffective. A much more beneficial approach would be ensuring the cooperation of neighboring countries' governments. The diligent monitoring and reporting of animal health in host countries would be a much more successful approach as this could ensure that in the event of outbreaks, all trade between countries is stopped.