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Promoting Rural Livelihoods and Public Health Through Poultry Microfinance: Evidence from Lao PDR

Drew Behnke, Phingseng Channgakham,
Joachim Otte, and David Roland-Holst

Mekong Region Report

1. Introduction

Throughout Lao PDR, livestock production is one of the most important agricultural activities in rural areas especially among poor households. Livestock products provide not only much needed food or income, but also represent a crucial form of savings because livestock can readily be sold for cash in times of need. Because most rural households do not have access to traditional finance institutions where savings can be deposited, livestock provides an important and necessary risk diversification strategy. Unfortunately, savings in livestock are prone to shocks, especially from animal disease. Thus, livestock presents a savings opportunity for the rural poor, but it comes with a relative high degree of risk. This problem is compounded by the fact that producers are often unable to restock their assets after a disease incidence because of limited financial access.

The vast majority of livestock production in Lao PDR exists in a traditional, smallholder system and animals are rarely produced for market. Therefore, the Lao PDR government has created policies, including technical advice from District Agriculture and Forestry Offices (DAFOs) and interest rate subsidies on agriculture loans, to encourage producers to commercialize their livestock production. Despite these attempts, the livestock sector in Lao PDR still faces several difficulties in the transition towards commercialization including low market access rates, low levels of technology, and capital constraints.

Poultry production is the most common form of livestock production especially amongst the rural poor because the inputs of production are so low. This grants the rural poor an inexpensive, yet vital, source of protein and ancillary income. Despite the prevalence of poultry production, commercialization rates are extremely low and more than 90% of poultry producers exist in a traditional extensive system with birds produced for home consumption rather than for the market. Furthermore, outbreaks of Highly Pathogenic Avian Influenza (HPAI) have decelerated the process of commercialization and development of the poultry sector.

Microfinance presents a possible solution both to the problems of limited savings and marketing opportunities that face smallholder producers. Access to credit is an empowering tool because it provides producers an opportunity to restock their flock in the event of a disease outbreak. This in turn can allow smallholders to increase flock sizes, because the losses from disease will not be as damaging. Additionally, larger flock sizes allow producers to increase rates of commercialization, which provides more income and an opportunity for further savings. Furthermore, microcredit loans grant producers the necessary capital they need to invest in infrastructure and biosecurity, ultimately increasing product quality and value. Thus microcredit loans for poultry production are a tremendous opportunity to reduce the limitations of savings opportunities for smallholders and increase marketing rates and livelihoods.

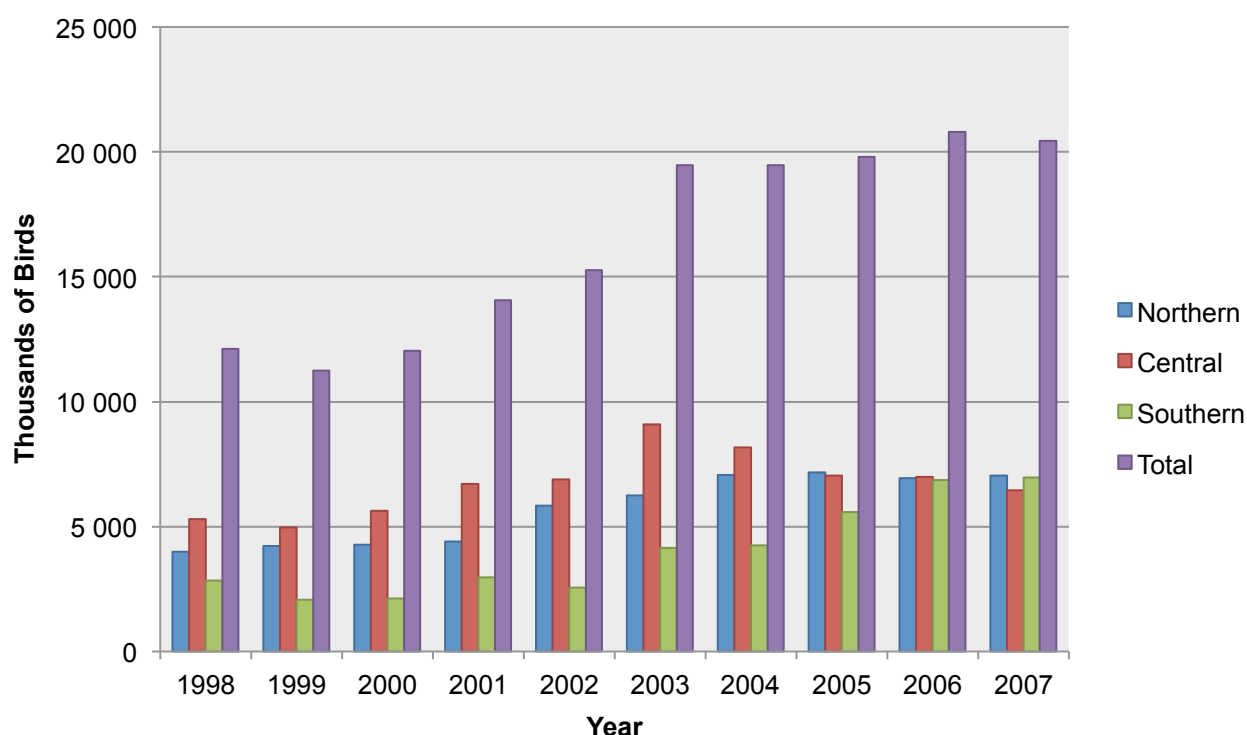
2. Background

2.1 The Lao PDR Poultry Sector and Policies: Before and After HPAI

Poultry production is vital source of protein for households in Lao PDR, especially those in rural areas. According to the most recent Lao Expenditures and Consumption Survey (LECS IV), a socio-economic survey conducted every 5 years, meat represents more than 20% of the diet of the Lao population. Although the LECS does not disaggregate between types of meat it can be expected that poultry products represent a significant portion of this total given the prevalence of poultry production (NSC 2009).

However, income from poultry sales is small compared to other agricultural outputs such as crops, which can be explained by poultry's small share of total agriculture production. For example, the LECS IV shows that only 5% of total household agriculture production was poultry, while crops accounted for more than 50%. Furthermore, most poultry is produced for household consumption rather than for the market. Poultry represented only 3% of total agricultural sales and of these sales only 32% was sold in a market (NSC 2009). This indicates that most households produce poultry for home consumption, and when sales do occur it is typically to other households within a village.

Looking at the poultry population, the total stock in the poultry sector has been rising steadily over the past decade. Since 1999, population levels have almost doubled, growing on average by 9.5% annually until 2006. In 2007, poultry population decreased for the first time since 1999 falling to 20.5 million birds, representing a 1.7% decrease in stock (Figure 1).

Figure 1: Poultry Population in Lao PDR, 1998 - 2007

Source: NSC, 2005 and MAF, 2008

Figure 1 demonstrates that the poultry population increased rapidly from 2002 to 2003, especially in the central region fueled by growth in the commercial sector in the Vientiane Capital province. However, after HPAI outbreaks many producers either stopped poultry production or switched to other agricultural activities that were deemed less risky. As a result, the national flock increased much slower after the HPAI outbreaks, increasing only by 200,000 birds from 2004 and 2008 (NSC 2005 and MAF 2009). In the Vientiane Capital province, the flock size decreased drastically falling from a high of 2.7 million birds in 2003 to 800,000 birds in 2007. This sharp reduction in the Vientiane poultry population is reflected clearly in Figure 1 as the regional distribution of the national poultry flock became equalized after HPAI outbreaks.

According to the Vientiane Capital Agriculture and Forestry Office (VAFO), approximately 404,000 birds were lost from HPAI outbreaks in the Vientiane Capital resulting in direct monetary losses of \$958,695 USD (assuming an average value of \$2.4 USD per bird). Additionally, the government was initially responsible for

compensating farmers for their loss, which added a further \$575,217 USD to the economic impact of HPAI in the Vientiane Capital. However, not only did farmers incur a financial loss from the loss of their assets, but this may also have lead to further strain on future income flows. For example, the Ministry of Agriculture and Forestry (MAF) estimates that the loss of 500 birds from an average broiler farm can cause an income loss of \$1,100 USD per month. This income loss creates further complications, as farmers may be unable to repay loans or access new credit to finance new flocks, feed, and medications (MAF, 2004 as quoted by Burgos et al, 2008).

The loss of income for large producers in the Vientiane Capital caused many large farms to become indebted with financial institutions. According to the VAFO, in 2004 large-farm producers had debts (including loans and interest) of approximately \$160,000 USD. To solve this problem, the VAFO provided a plan to the government to forgive the interest for producers who were in debt and requested banks to provide inexpensive loans to farmers for production of other animal products such as pigs or fish. Unfortunately this proposal was not implemented in the field. The banks, especially the Agriculture Promotion Bank (APB), stopped providing loans to farmers that had HPAI outbreaks and farmers were still responsible to repay their debt.

2.2 The Structure of Rural and Microfinance in Lao PDR

Financial services in Lao PDR can be classified in one of three sectors: the formal, semiformal and informal sectors. The formal sector consists of commercial banks which are either state owned, joint ventures, or foreign. The semiformal sector is comprised of project-based interventions to provide rural and microfinance services, and are generally backed by multi- or bilateral development agencies and international non-governmental organizations (INGOs). The informal sector represents loans between family and friends, informal moneylenders, and lending through the traditional Lao *houay*.

2.2.1 The Formal Financial Sector

Amongst the commercial banks in the formal financial sector, two banks were created as policy banks to provide subsidized loans specifically for the agricultural sector. These banks are the long running APB, which was established in 1993, and the newer Nayobai bank created in 2007. Nayobai represents a further attempt to provide financial services to the poor as it only lends to the country's 47 poorest priority districts.

APB is the most dominant source of agriculture loans representing 66% of the total portfolio in the first quarter of 2004. APB's loan products range from short-term to over 10 years in maturity for certain policy-based loans. Loans are given to individuals, group guarantee borrowers, SOEs, and companies. For group guarantee loans, no physical collateral is required. Instead, all members of the borrowing group must guarantee repayment of the total sum required creating a social collateral (Coleman and Wynne-Williams 2006).

Despite the Lao PDR government's intentions of using the ABP to deliver rural financial services through directed, subsidized credit, it appears to have little success. In a 2004 survey conducted by the Asian Development Bank, it found that the ABP only served the credit needs of 2% of rural households. Other commercial banks fared no better and in total the entire formal sector made loans to less than 3% of rural households (Coleman and Wynne-Williams 2006).

2.2.2 The Semiformal Financial Sector

The semiformal financial sector consists of project based initiatives that provide rural and microfinance services. These projects are sponsored by multi- or bilateral organizations, INGOs, or autonomous microfinance initiatives (MFIs). In general, this sector can be classified under three main types:

- Savings and Credit Unions (SCUs): These operate under the Central Bank of Lao PDR (BOL) regulations and take savings and make loans. Members' subscriptions and savings are combined with project funds to make loans.
- Village Savings and Credit Groups (VSCGs): These also take savings and make loans but do not operate under BOL regulations.

- Village Revolving Funds (VRFs): These do not take savings, and use project funds to disburse loans. VRFs also do not operate under BOL regulations.

Loans are most commonly given in cash, although some MFI give loans in kind (rice grain, buffalo, etc). The purpose of loans varies widely depending on the sponsoring organization. For example, multi- and bilateral organizations portfolios are distinguished by their concentration in livestock (34.27%), crop production (33.37%) and handicrafts (15.25%), the INGOs by concentration in livestock (70.9%), crop production (18.26%), and the MFIs by concentration in the trade (71.01%) and handicraft sectors (21.14%). Loans are generally small amounts and for a short term investment with median terms ranging from 12 to 6 months. Loan collateral varies depending on the sponsoring organization as well, with some requiring no collateral while others require either a group guarantee or physical collateral (Coleman and Wynne-Williams 2006).

The semiformal sector fares only slightly better in reaching the rural community than the formal sector, making loans to 4% of households. VRFs were the most common source among the semiformal sector with an estimated 2.18% of rural households borrowing from this source in the 2004 ADB survey (Coleman and Wynne-Williams 2006).

2.2.3 The Informal Sector

The informal sector consists of loans from any untraditional or informal channels such as between friends and family, moneylenders, or the Lao *houay*.

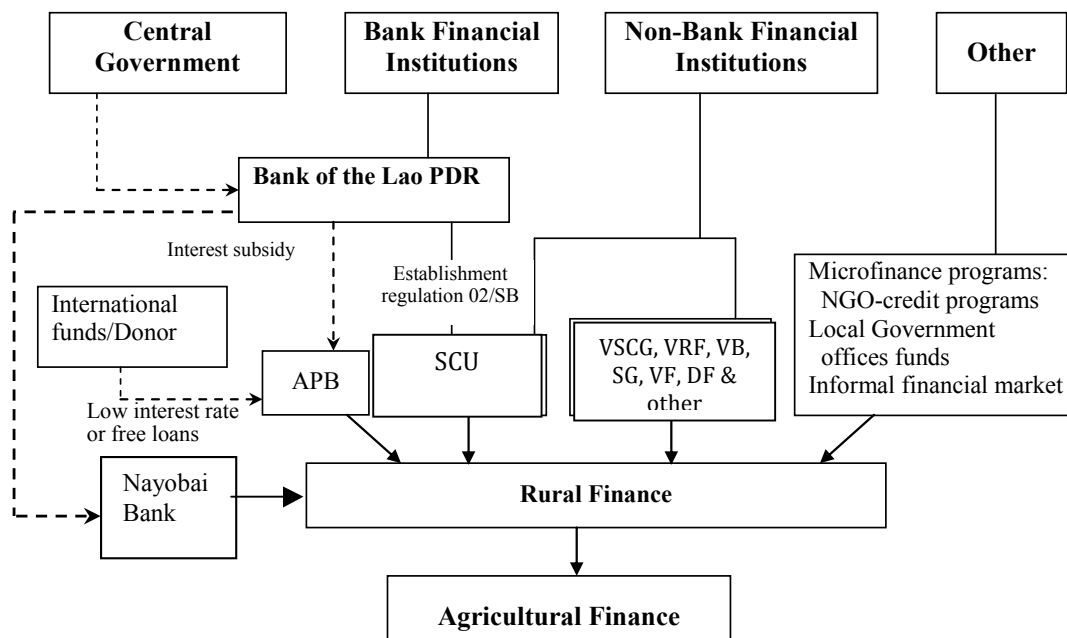
In the informal sector the vast majority of loans are in cash. Moneylenders represent a more formal source of loans than borrowing from other households, which can be expected given their business interests in lending. For example, moneylenders are 3 times more likely to require written loan agreements and 4 times more likely to require collaterals than loans from other households. Moneylenders also have lower levels of overdue loans than other households and charge higher interest rates. Regular collection of loans is also more frequent amongst moneylenders and moneylenders are about 7 times more likely to give loans where the interest is payable monthly.

The informal sector is the most common source of loans amongst the rural community reaching 33% of rural households. Loans between friends and family are the most common with 25% of rural households reporting borrowing from this source in the ADB survey. Moneylenders were the fifth most common channel overall, giving loans to 1.87% of rural households (Coleman and Wynne-Williams 2006).

2.2.4 Rural Finance and Poultry Production

Figure 2 summarizes the channels that a poultry producer has in acquiring loans. Although a poultry producer has a variety of sources of capital, access to capital still remains a major constraint facing smallholders. While there are formal financial source that provide loans to the agriculture sector, these are widely underutilized, and many rely on their own capital or the informal sector, which are often inadequate. As a result, man farmers are unable to produce commercially and are locked out of the higher value urban markets.

Figure 2: Structure of Agriculture Finance

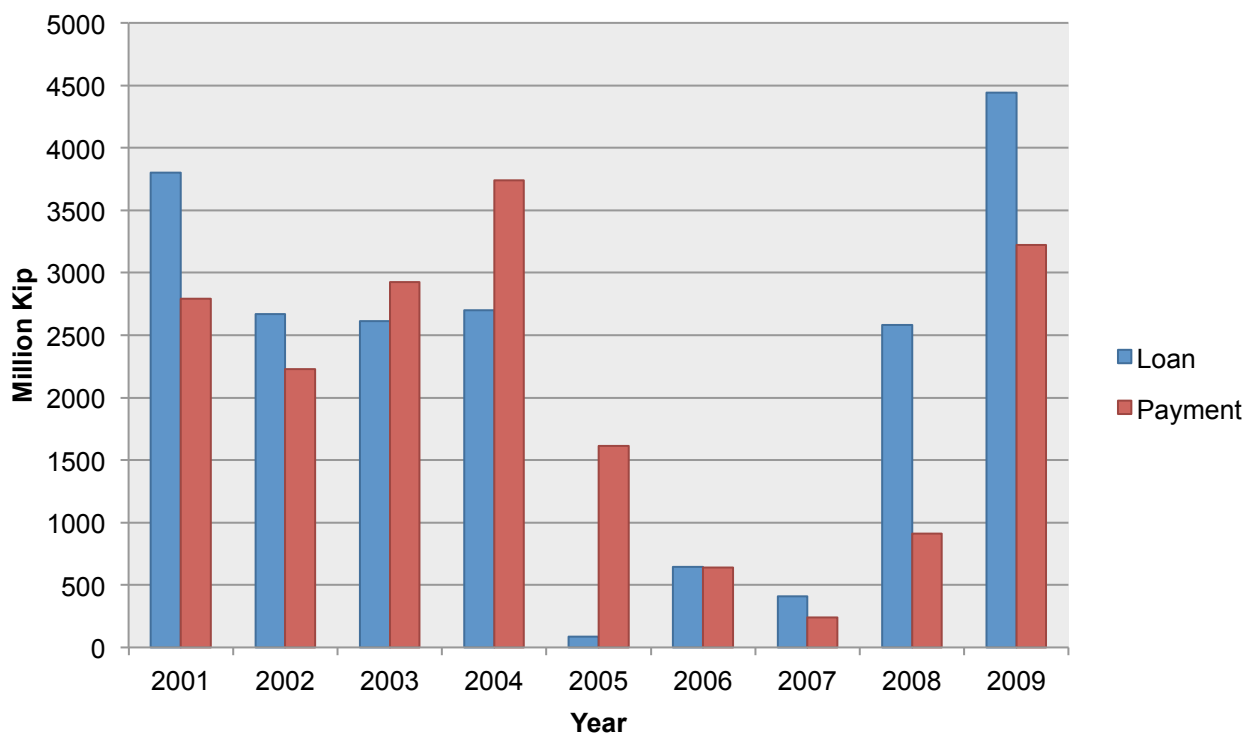


Source: Prepared by Authors

Furthermore, farmers that acquire loans for agriculture production typically use the loans for other purposes rather than for poultry production. Often farmer's main commercial activities are crop or other livestock production and birds are raised only to supplement their main activities. As a result, most of the loans for livestock production are used for larger, more expensive animals such as pig and cattle.

Data from the ABP shows how HPAI has affected loans for poultry production. Figure 3 demonstrates that after the first HPAI outbreak in 2004, loans for chicken production fell sharply. This can be explained by the belief that loans for poultry production had a high level of risk, as farmers that contracted HPAI were expected to default. However, after the HPAI situation stabilized, the ABP began to increase loans for chicken production again, and provided 16% and 15% interest rates in 2008 and 2009 respectively. The increased loans were fueled by a government commitment to pay 7% interest on the loans in order to reduce costs to poultry farmers help recover the poultry industry.

Figure 3: ABP Loans for Chicken Production



Source: APB 2010

2.3 Credit Constraints and Poultry Production

Credit constraints are an especially important issue for rural and smallholder finance, because they are widespread amongst smallholders and are severely limiting in increasing rates of marketing and improving livelihoods. Because we are concerned with how financial services can improve smallholder livelihoods, understanding and identifying credit constraints is essential.

2.3.1 Credit Constraints Background

Numerous studies have found positive results that credit access can ensure the production, profit, and consumption of farm households (Feder et al. 1989, 1990; Sial and Carter 1996; Duong and Izumida 2002). Credit access was also found to be an import tool in augmenting the use of inputs, which is particularly relevant for smallholders given their limited resources to allocate on inputs (Binswanger and Khandker 1995).

Conversely, credit constraints may discourage smallholders from producing, limit consumption, and therefore can be considered a barrier to poverty reduction strategies based on credit schemes. Furthermore, credit constrained households face a difficulty in deciding on how to allocate credit between consumption decisions and farm production decisions while unconstrained households do not (Foltz 2004).

There are many factors that cause farm households to face credit constraints, and thus identifying exactly how smallholders are constrained presents a challenge. Several previous studies have employed the narrow definition of credit constraints, which are mainly based on supply side constraints. Often times, the narrow definition is based on information from financial institutions, which makes this approach difficult to identify credit constraints among households who do not borrow from financial institutions.

To address this problem, recent studies have used household survey information to identify credit constraints on the demand side. In doing so, households are considered constrained capitally if they demand more credit at the current interest rate, or if household's demand loans, but could not obtain credit or were rejected (Feder et al 1990, Duong and Izumida 2002, and Petrick 2004). Although looking at demand side

credit constraints expands the narrow definition, this approach still does not identify constraints of households who have never applied for loans yet may still suffer from credit constraints due to risk and transaction costs rationing.

2.3.2 Comprehensive definition of Credit Constraints

Recent studies (Boucher et al. 2005 and Gilligan et al. 2005) have used a hypotheses questionnaire to develop a comprehensive definition of credit constraints and therefore identify all households that face constraints. Under the comprehensive definition, farm households are classified as credit constrained when they face any of the following classification:

1. Borrowers have a lower observed demand than potential demand, as they want to borrow more under the current interest rate.
2. Borrowers take loans from more than one source (for one agriculture activity).
3. Non-borrowers have a positive potential demand for loans (i.e. they want to borrow but are unable).
4. Non-borrowers who are non-applicants that would apply for a loan if they thought that banks would lend
5. Non-applicants who do not want to apply for loans, even though they believe that banks would lend, because of risk and transaction cost rationing.
6. Non-borrowers who are non-applicants that would apply for a loan if they believed they were eligible
7. Non-applicants who do not want to apply for loans, even though they strongly believe that banks would consider their application, because of risk and transaction cost rationing.

The narrow definition of credit constraints encompasses classifications (1) through (3), while the comprehensive or broad definition is extended to all the classifications. Classifications (1) – (3) and (6) are supply-side constraints, while classifications (4), (5), and (7) are demand-side constraints. Our study applies the comprehensive definition to identify credit constraints on both the supply- and demand-side. Our questionnaires ask hypothesis questions regarding financial access and services, allowing us to determine which households face credit constraints, and which do not.

3. Survey Methodology

To better understand how financial access and capital constraints affect poultry production, surveys were implemented in the Vientiane Capital province from December 2009 to February 2010. Questionnaires consisted of two distinct parts covering the actors in the market chain that supply poultry products and the urban consumers of those goods. Market chain surveys included detailed producer, trader, and vendor surveys and the second part of surveys consisted of household consumer surveys.

3.1 Sample Design

The Vientiane capital metropolis is predominately spread along the Mekong River and south-central part of the province, spanning five districts. The surrounding four districts represent large areas of rural agriculture land that are used to provide agro-food products to the urban center. Thus by separating villages between rural and urban, we created natural categories to capture the rural producers that supply the urban vendors and consumers. Therefore producer surveys were predominately conducted in rural areas, while household and vendor surveys were only conducted in urban areas.

Under the government classification scheme, villages are classified as urban, rural, or rural without roads. Both urban and rural villages were included in the sample, but rural villages without roads were not. This decision was made based on the fact that we are concerned with how financial access and capital constraints affect poultry market chains. We assumed that villages without road access do not contribute to the greater poultry supply chain and operate in a closed market system. Thus these villages have little relevance to our study and were not included. Furthermore, only urban villages in the five districts¹ containing the Vientiane Capital metropolis were included in the consumer sample. Although the remaining districts² have government classified urban areas, these are more likely to be peri-urban where poultry purchasing will be limited, making a random sample difficult to implement.

¹ Chanthabouli (01), Sikhottabong (02), Xaisettha (03), Sisattanak (04) and Haxayfong (07)

² Naxaythong (05), Xaithani (06), Sangthong (08) and Pakngum (09)

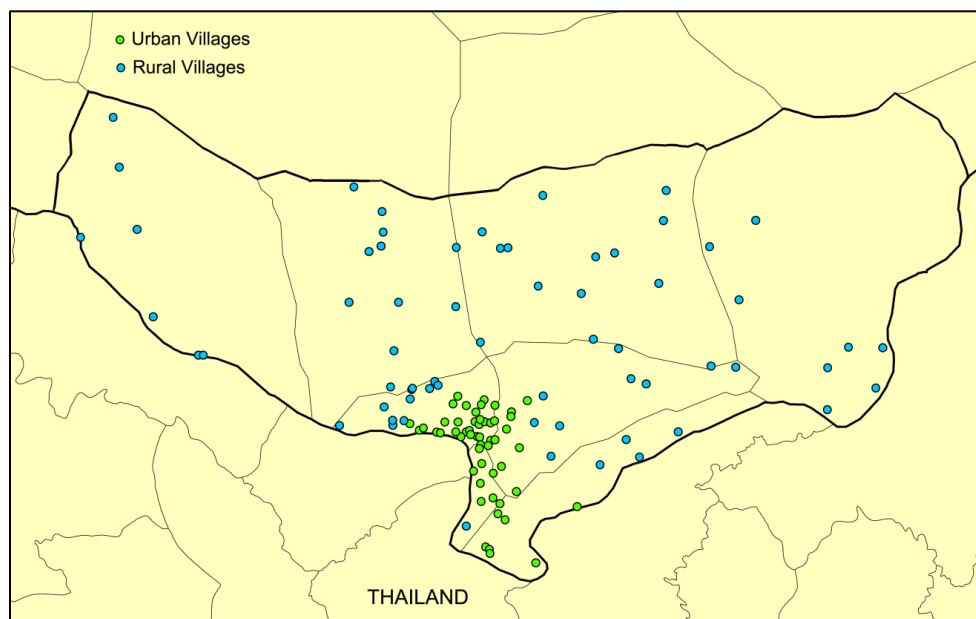
Our sample was drawn from a combination of the households surveyed in LECS IV and households selected from our own random sample. Re-sampling the households from the LECS IV was desirable because it allows us to match our data to a variety of other socio-economic indicators. In total, the LECS IV covered 48 villages in the Vientiane Capital province split between 32 urban and 16 rural villages. Only 16 households in each village were surveyed and thus only resurveying the LECS IV households would not cover our ideal sample size. Therefore, to reach our target goal we had to include an additional 30 urban and 50 rural villages which were selected randomly using a probability proportional to size (PPS) methodology. This was done using the PPS.do command in STATA, which is published by the World Bank.³ Villages were drawn from the most recently updated village lists from the National Department of Statistics.

In total, this created a sample frame of 128 villages split between 46 urban and 82 rural villages (Table 1).

Table 1: Number of Vientiane Capital Sample Villages

	Urban		Rural		Total
	LECS IV	Own Sample	LECS IV	Own Sample	
Vientiane Capital	16	30	32	50	128

Figure 4: Map of Vientiane Capital Province Survey Locations



³ PPS.do file & documentation can be found online: <http://www.worldbank.org/html/prdph/lsmis/manage/pps.html>

3.2 Poultry Farmer Survey Implementation

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.

Producer survey implementation was done using a combination of direct and random targeting. Implementation was also split between urban and rural areas. In urban LECS IV villages, producers were directly targeted using data from the LECS IV. Any household that was found to be raising poultry when the survey was conducted was re-surveyed with a producer questionnaire. In urban villages drawn from our own sample, producer observations were capped at 2 per village due to the prevalence of smallholder urban poultry production. Thus a 2-stage random sample was feasible, and enumerators visited every 4th household and targeted them either as a consumer or producer until 2 producer observations were recorded.

In rural LECS IV villages, households were also directly targeted using data from the LECS IV. Enumerators would visit all 16 households interviewed in the LECS IV and give producer surveys if the household raised birds. If not every household raised birds or a household could not be located, additionally producer observations were recorded as needed by visiting every 4th household at random until 16 producer observations were recorded. In rural villages drawn from our own sample, producers were found using a random selection process. Enumerators randomly selected a household in a village and then visited every 4th until 16 observations were recorded.

In both urban and rural areas, largescale producers in sample villages were directly targeted due to their limited numbers. Largescale producers were located by talking to village chiefs or other farmers in the selected villages and enumeration teams were instructed to actively seek out all largescale farmers during smallholder surveys. This was actually conducted first to ensure all largescale producers would be covered.

3.3 Aggregator Survey Implementation

Aggregators are by far the most difficult group to interview given their nature of work. Additional motivation was given to enumerators by making aggregator questionnaires worth the most, despite being shorter than other surveys. Aggregators were searched for in both urban and rural areas and were located by any means possible. Primarily, this was done by speaking with farmers, village chiefs, and market vendors and using this information to locate traders. Enumerators would also obtain contact information and attempt to contact aggregators directly. Aggregators were also occasionally located directly at markets, households, or farms and interviews were conducted upon site.

3.4 Market Vendor Survey Implementation

Market surveys were conducted in the markets that serve the urban villages where consumer surveys were implemented. Markets were found in two ways in Vientiane. First, we obtained a list of registered markets in the Vientiane municipality, which listed all of the major markets. Additionally we relied on enumerators for local knowledge to visit any remaining markets in the Vientiane metropolis that were not on the official government list. In total this resulted in 21 markets being visited.

Enumerators visited markets during off-peak hours and attempted to interview every vendor that sold poultry meat. Enumerators also asked vendors if there were other vendors missing that were normally there so that a complete coverage of all vendors could be conducted. Enumerators revisited the same market several times in order to speak to all the vendors there.

3.5 Consumer Household Observations

Consumer surveys were only implemented in urban villages and were separated between LECS IV villages and villages from our sample. Households in the LECS IV villages that did not raise poultry when the LECS IV was conducted were targeted directly as consumers. Also if a household was targeted as producer and no longer raised birds, or could not be located, then enumerators would conduct a household survey to replace these observations. Enumerators would either re-survey the household that no longer raises birds or find another household at random for replacement observations.

For villages from our sample, households were selected at random. Enumerators would first select a household in the sample village at random, and then visit every 4th household until 14 observations per village were recorded. In total, 1806 consumer observations were recorded

3.6 Observation Totals

In total, 2,068 observations were recorded in the Vientiane Capital Province. These observations were split between 1284 market chain and 784 consumer observations with approximately 1,000 observations in rural and urban areas (Figure 2).

Table 2: Vientiane Capital Observations

Questionnaire Type	Observations
Smallscale Producer	1,050
Large Chicken Producer	80
Large Duck Producer	28
Aggregator	27
Market Vendor	99
Consumer	784
Total	2,068

4. Survey Findings

4.1 Borrowers

Questionnaires attempt to discover the importance of how rural and microfinance can improve poultry production in order to promote livelihoods. Survey data finds that aggregators and market vendors are the most common recipients of financial services, while only a small percentage of smallscale producers had access to credit (Table 3). Large chicken farmers were greater recipients of loans than large duck and smallscale farmers, but their numbers are still small with only 12% of farms receiving loans. These findings implies that although microfinance and rural financial services have been greatly developed and extended in Lao PDR, financial services still do not reach and encourage poultry producers in significant numbers. These numbers are even more surprising when considering the location of our sample frame. The Vientiane Capital is home to the most financial resources in the country, and even so, loans to poultry producers are limited. Capital constraints are a likely explanation to the low levels of financial access among poultry producers, which will be discussed later.

Table 3: Percentage of Supply Chain Actors That Borrowed Money to Finance Poultry Business

Smallscale Producer	3.77%
Large Chicken Producer	12%
Large Duck Producer	3.57%
Aggregator	22.22%
Market Vendor	23.23%

Table 3 – 7 shows situations where a borrower may face credit constraints. The first problem concerns borrowers that were rejected from a financial provider for a loan within the previous year. Although all of these supply chain actors have received a loan, many were rejected for loans and needed subsequent attempts before they could acquire financing. The large duck data is slightly misleading because only one large duck producer received a loan and was rejected from a previous request. Regardless, loan rejections were most common with large producers followed by aggregators, and finally small producers (Table 4).

Table 4: Percentage of Supply Chain Actors Who Borrowed Money That Were Rejected for a Previous Loan

Smallscale Producer	13.33%
Large Chicken Producer	25%
Large Duck Producer	100%
Aggregator	16.67%
Market Vendor	N/A

The next potential for capital constraints arises from supply chain actors that have to borrow from more than one financial source. Our results indicate that smallscale producers and market vendors are more likely to face capital constraints than the other supply chain actors because they received loans from a wide variety of financial sources. Amongst smallscale producers, the APB was the most important credit source, while market vendors used credit rotation groups most frequently. Overall the ABP was the most common source of credit amongst all the supply chain actors, which can be expected given its large presence in the Vientiane Capital. Although the ABP has been the most important source for microcredit in recent years, it is interesting to note the rise of commercial banks providing loans to the poultry sector, especially among large producers with more than 20% receiving loans from commercial banks (Table 5).

Table 5: Source of Loans for Supply Chain Actors

	Smallscale	Large Chicken	Large Duck	Aggregator	Vendor
Commercial Bank	2.94%	22.22%	0%	0%	0%
ABP	44.12%	22.22%	100%	33.33%	4.35%
Nayobai Bank	11.76%	22.22%	0%	0%	0%
Saving Group	26.47%	0%	0%	33.33%	13.04%
Credit Coop.	5.88%	11.11%	0%	0%	4.35%
Moneylender	2.94%	11.11%	0%	0%	8.70%
Friends	0%	0%	0%	0%	26.09%
Relatives	8.82%	11.11%	0%	16.67%	4.35%
Traders	0%	0%	0%	0%	0%
Vendors	0%	0%	0%	0%	4.35%
Credit Rotation Group	0%	0%	0%	16.67%	34.78%
Others	5.88%	0%	0%	0%	0%

Looking at the average amount requested and amount received among supply chain actors demonstrates another potential capital constraint. Survey findings demonstrate that on average the supply chain actors did not receive the full amount of loans requested. However, it should be noted that the amount requested and received is often only slightly less, and it appears this issue may not be the main cause of capital constraints amongst supply chain actors. On average, smallholder loans were the smallest worth approximately \$465 USD on average. Large producers had much larger loan sizes ranging from \$11,524 for chicken producers to \$9,756 for duck producers (Table 6).

Table 6: Average Amount Requested and Recieved (LAK), (\$1 USD = 8200 LAK)

	Smallscale	Large Chicken	Large Duck	Aggregator	Vendor
Amount Requested	3,916,667	96,222,222	80,000,000	11,233,333	4,478,261
Amount Received	3,817,142	94,500,000	80,000,000	10,900,000	4,456,252

Table 7 is more indicative of the prevalence of unmet loan demand capital constraints among supply chain actors. This table illustrates that although the supply chain actors were able to receive almost the full amount of loan they requested, this amount was still often not large enough for their investment. This is most common among smallscale producers; with nearly half of borrowers reporting the loan size was not large enough for their investment and more than 80% wanting to borrow more under current interest rates. Although large chicken producers and aggregators had less unmet loan demand, they were more likely to want to borrow more than smallscale producers (Table 7).

Table 7: Credit Constrains, Unmet Loan Demand

	Smallscale	Large Chicken	Large Duck	Aggregator	Vendor
Loan Amount Not Large Enough For Investment	48.48%	22.22%	0%	16.67%	4.35%
Want to Borrow More (Those with Unsatisfactory Loan Amount)	81.25%	100%	N/A	100%	N/A

Looking at debt amongst borrowers we see that despite several supply chain actors reported having debt, all of them claim they have the ability to repay that debt. Although

all the respondents state they can pay back the debt, we must question if the payment is in time or not. In some cases, the borrowers can pay back the loan, but the payments may be delayed. This can reduce the borrower's chances of receiving future loans from the same financial service provider. Furthermore, debt is a major criterion that financial providers examine in deciding to loan to new applicants or not. This can help explain why large chicken producers had the highest percentage of rejections of previous loans, as over 60% of borrowers have debt (Table 8).

Table 8: Debt

	Smallscale	Large Chicken	Large Duck	Aggregator	Vendor
With Debt	20%	62.50%	0%	16.67%	N/A
Able to Pay Back Debt	100%	100%	N/A	100%	N/A

4.2 Non-Borrowers

Looking at the supply chain actors that are non-borrowers, the most important capital source for smallscale, large chicken producers, and market vendors were gifts from family. For aggregators and large duck producers, their own savings was the most important source, particularly for aggregators. This evidence demonstrates that saving among smallscale producers is under-developed, and this may cause difficulties for MFIs in terms of deposit mobilization because savings are so limited (Table 9).

Table 9: Sources of Capital (Non-Borrowers)

	Smallscale	Large Chicken	Large Duck	Aggregator	Vendor
Own Savings	33.87%	39.39%	40.74%	71.43%	55.26%
Income from Other Activities	13.87%	19.70%	11.11%	38.10%	14.47%
Gift From Family	62.21%	68.18%	37.04%	42.86%	76.32%
Other	0.90%	0%	0%	0%	3.95%

Traditionally, non-borrowers were defined as non-constrained by financial sources, but this study attempts to identify all non-borrowers that are constrained by applying a hypothesis questionnaire. By taking this approach, the results show that more than half

of supply chain actors may face credit constraints because they believe that they would get a loan if they applied for it (Table 10). There are several reasons why these non-borrowers may have credit constraints, which are shown in table 10. Major sources of credit constraints come from risk rationing; particularly fear of being indebted, risking land for collateral, and high interest rates. Many supply chain actors also reported having enough capital investment, and thus have no demand for loans. However, these respondents are only considered unconstrained if they list having enough capital, or no need for loan, as their only reason for not applying for a loan (Table 11).

Table 10: Belief that Financial Institutions Would Lend If Submitted Loan Application (Non-Borrowers)

	Smallscale	Large Chicken	Large Duck	Aggregator	Vendor
Yes	69.66%	72.37%	68%	52.38%	N/A
No	30.34%	27.27%	32%	47.62%	N/A

Table 11: Reasons for Not Applying for Loan, Those who Believe That They are Eligible (Non-Borrowers)

	Smallscale	Large Chicken	Large Duck	Aggregator	Vendor
Have enough capital investment	39.44%	29.17%	52.94%	45.55%	N/A
Afraid to be indebted	70.23%	39.58%	76.47%	72.73%	N/A
No need for loan	8.36%	2.08%	0%	0%	N/A
Do not know place to borrow	3.81%	2.08%	0%	0%	N/A
Financial offices too far	1.17%	0%	11.76%	0%	N/A
High Transaction Costs	4.25%	4.17%	5.88%	9.09%	N/A
Do not want to risk land for collateral	21.99%	33.33%	11.76%	0%	N/A
High interest rate	9.38%	35.42%	11.76%	9.09%	N/A
Other	0.88%	0%	0%	0%	N/A

4.3 Credit Constraints

Looking at our data in aggregate we see that most smallscale producers, either borrowers, or non-borrowers face credit constraints. Constraints are much more common among non borrowers, with over 80% of all actors facing constraints and only 14% on average not being constrained. These findings identify major challenges for rural and microfinance in order to improve credit access by reducing capital constraints among poultry producers. Smallscale producers are the most constrained group of all, and inadequate credit access presents a serious limitation to the promotion of commercialization and improved standards of living (Table 12).

Table 12: Credit Constraints

	Borrower (N=78)		Non-Borrower (N=1185)	
	Constrained	Non-constrained	Constrained	Non-constrained
Smallscale	58.26%	41.38%	86.82%	13.18%
Large Chicken	37.5%	62.5%	84.84%	15.16%
Large Duck	0%	100%	85.19%	14.81%
Aggregator	33.33%	66.67%	85.71%	14.29%

5. Identification of Eligible Farmers for Microfinance Services

Our survey findings reveal the prevalence of credit constraints among smallholders in the Vientiane Capital. Although microfinance is believed to be a powerful tool in helping smallscale farmers increase rates of marketing and ultimately income, access to credit prevents many producers from receiving these benefits. Given MFIs limited resources we attempt to identify households that appear to have the most to gain from utilizing microfinance services. After these households are identified we can expand our findings to a national level using LECS IV survey data, and illustrate the regions where MFIs would appear to have the strongest impact on smallholder producer livelihoods.

First identifying smallscale farmers from our sample we identify households that have sold poultry within the past year. Because we are interested in increasing rates of marketing, we can assume households that have not sold in the previous year produce for home production only and would have little to interest in utilizing microfinance services for poultry production. As rural and microfinance becomes more widespread in Lao PDR this requirement may be relaxed so that even households that produce only for home consumption can attempt to make the transition to commercial production.

Next we identify smallscale producers that have taken out a loan for poultry production in the previous year or households that want loans but are capitally constrained. Identifying these farmers allows us to drop those that have no desire for loans and thus would not benefit from microfinance for poultry production.

After identifying the most eligible households from the Vientiane Capital surveys, we then attempt to extend these results to the national level using LECS IV data. Using similar identification criteria, we can identify the provinces where microfinance would be most beneficial for poultry production.

5.1 Identifying Eligible Farmers from Our Own Sample

Using the criteria discussed above we are able to identify 319 smallscale farmers from our sample of 1,050 that can be expected to benift most from microfinance access.

These eligible households differ from ineligible households in several distinguishing features, which are shown in table 13.

Table 13: Summary Statistics by Eligibility Group

Group	Land Size (HA)	Flock Size	Poultry Income	% Income From Poultry	Received Loans	Capital Constraints
Eligible Farmers	1.33	45	106,503 LAK/month	14.6%	9.03%	96.87%
Ineligible Farmers	1.12	35	30,993 LAK/month	3.23%	1.52%	55.13%

Eligible farmers have slightly more agriculture land and larger flock sizes than ineligible farmers, which can be expected given these farmers are more likely to produce birds for sales. However, it is relevant to note how similar these criteria are compared to the rest of the summary statistics. This signals that overall both farmers appear to have similar production systems, and would likely be difficult to tell apart by just looking at these criteria. However, looking at the other summary statistics reveals how different these groups operate.

Eligible farmers earn on average approximately 107,000 kip per month representing 14.6% of their total income, while ineligible farmers only earn 31,000 kip per month representing 3.23% of total income. This signals that poultry production is a much more important income generating activity for eligible farmers and therefore increasing market access for this segment of the smallholder populations should be made a priority. Furthermore, eligible farmers were also much more likely to have received loans for poultry production and both borrowers and non-borrowers face severe capital constraints.

Based on these summary statistics, the argument for increasing financial services to this segment of the smallholder producer population is strong. These producers have higher rates of marketing, and rely on poultry sales for a significant portion of their income. Although eligible farmers are much more likely to have received loans for poultry production, they are also very capital constrained. This reveals that financial

access is an important tool for these producers, yet most of them are shut out of financial markets.

5.2 Identifying Eligible Farmers from the LECS IV

Using LECS IV data allows us to expand a similar methodology to the national level to determine which provinces and regions stand to benefit the most from increased financial services to smallscale producers. However, in order to identify households in the LECS IV, parallel criteria must first be established due to differences in the questionnaires. Fortunately, two proxy criteria serve as excellent parallels to our own questionnaire, and can be used to identify eligible households.

The first criterion used is identifying households that have sold birds in the past 4 weeks. This serves as an almost exact proxy for our criteria, which identifies households that have sold birds in the past 12 months. This proxy is not perfect because it will leave out households that have sold birds in the past year but not in the past four weeks. These households may be identified as eligible in our survey, but cannot be captured in the LECS IV. One way to potentially capture these missed households are to relax our sales constraint and look at flock sizes which can be used as a proxy for sales. It can be assumed that households with a large enough flock size will be more likely to sell birds from time to time. A flock size of 45 birds or more is a good benchmark to indicate sales as indicated by the summary statistics from our sample data.

The next criterion used to select eligible households selects households that have borrowed money in the previous year. Unfortunately, the LECS IV data does not specify if loans are used for poultry production (or agriculture production), but we can assume that households that seek capital have a demand for financial services. This criterion also does not capture households that may want loans but face capital constraints, but there is no reliable way to identify these households in the LECS IV data.

There are obvious limitations in this approach. While the LECS IV contains strong data on poultry production for a national socio-economic survey, data on household finances is extremely limited. This means we are unable to assess what households took loans

specifically for poultry production or are capitally constrained. However, our proxy is still an important indicator for the success of increased microfinance access for poultry production. Most rural finance in Lao PDR is dominated by the informal sector, and the LECS IV data enforces this with at least 40% of loans coming from neighbors or friends, representing the single largest source. This means that eligible households demonstrate a clear commitment to selling poultry and have a demand for financial resources, yet must rely on the informal sector to fulfill their needs. Therefore despite the proxy shortcomings, we can still expect targeted microfinance initiatives for eligible poultry producers to be an important catalyst for improving livelihoods.

Using these criteria in the LECS IV we are able to select the most eligible households in the entire country. These households are assumed to be the most likely to benefit from increased financial services and can be used to create a national eligibility map, showing what provinces have the highest number of observations.

6. Results

Applying the criteria discussed above for the LECS IV data, we find 191 households in the first eligibility group. These households that would be the strongest candidates for increased microfinance services for poultry production. Relaxing our criteria to include households that do not sell birds, but have flock sizes of at least 45, we can add an additional 273 households bringing the total number of eligible households to 464 in the second eligibility category (Table 14).

Using sample weights from the LECS IV we can expand our selected households to estimate how many households in the entire country would be eligible. This demonstrates that a very large number of similar households would likely benefit from expanded financial services and thus strengthen our recommendations as a national poverty reduction strategy. For example, under our first eligibility category we find that our criteria can be extended to a possible 21,504 households representing 2.2% of the total households in the country. Relaxing our eligibility requirements extends the number of households to 60,982 nationwide, representing 6.2% of total households (Table 14).

Table 14: Summary of Eligibility Categories, LECS IV

Eligibility Category	Number of Observations	Accumulative Observations	Total Household Population Based on Sample Weights	Percent of Total Households
1	191	191	21,504	2.2%
2	273	464	60,982	6.2%

Tables 15 and 16 list the number of eligible households in each province using the different eligibility categories. Figures 5 and 6 show this data graphically on a map of Lao PDR, classifying the number of households into multiple strata. Once a household is considered eligible it is not counted in relaxed criteria. In other words the second eligibility category only considers households that were considered ineligible under the first set of criteria. However, both Table 16 and Figure 6 look at the cumulative number of observations by combining the first and second eligibility categories.

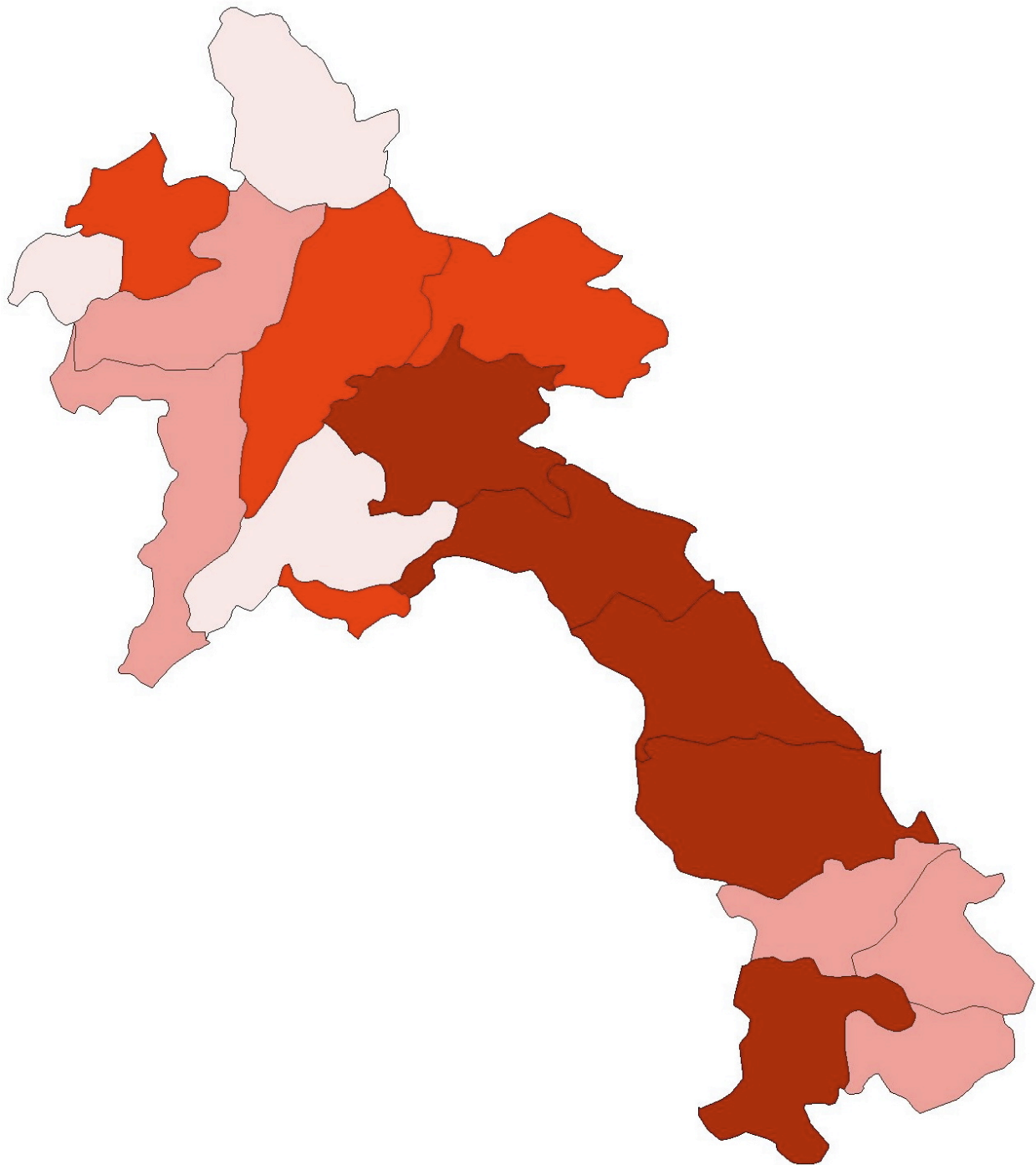
Table 15: Provinces with Most Eligible Households (Category 1)

Province	Region	Number of Households	Total Household Population Based on Sample Weights	Poultry Flock Size (Thousand Head)
Vientiane Capital	Central	14	2,352	808
Phongsaly	Northern	5	422	532
Luang Namtha	Northern	11	859	324
Oudomxay	Northern	10	1,426	834
Bokeo	Northern	2	213	433
Luang Prabang	Northern	13	1,283	1,374
Houaphanh	Northern	14	979	1,758
Xayabury	Central	7	804	1,781
Xiengkhuang	Central	16	1,526	800
Vientiane.M.	Central	4	562	1,557
Borikhamxay	Central	18	1,552	654
Khammouane	Central	16	1,697	629
Savannakhet	Central	16	2,540	2,007
Saravane	Southern	7	524	2,378
Sekong	Southern	9	551	553
Champasack	Southern	20	3,583	3,656
Attapeu	Southern	8	597	375
Xaysomboon SR	Central	1	34	N/A

Table 16: Provinces with Most Eligible Households (Category 1 & 2)

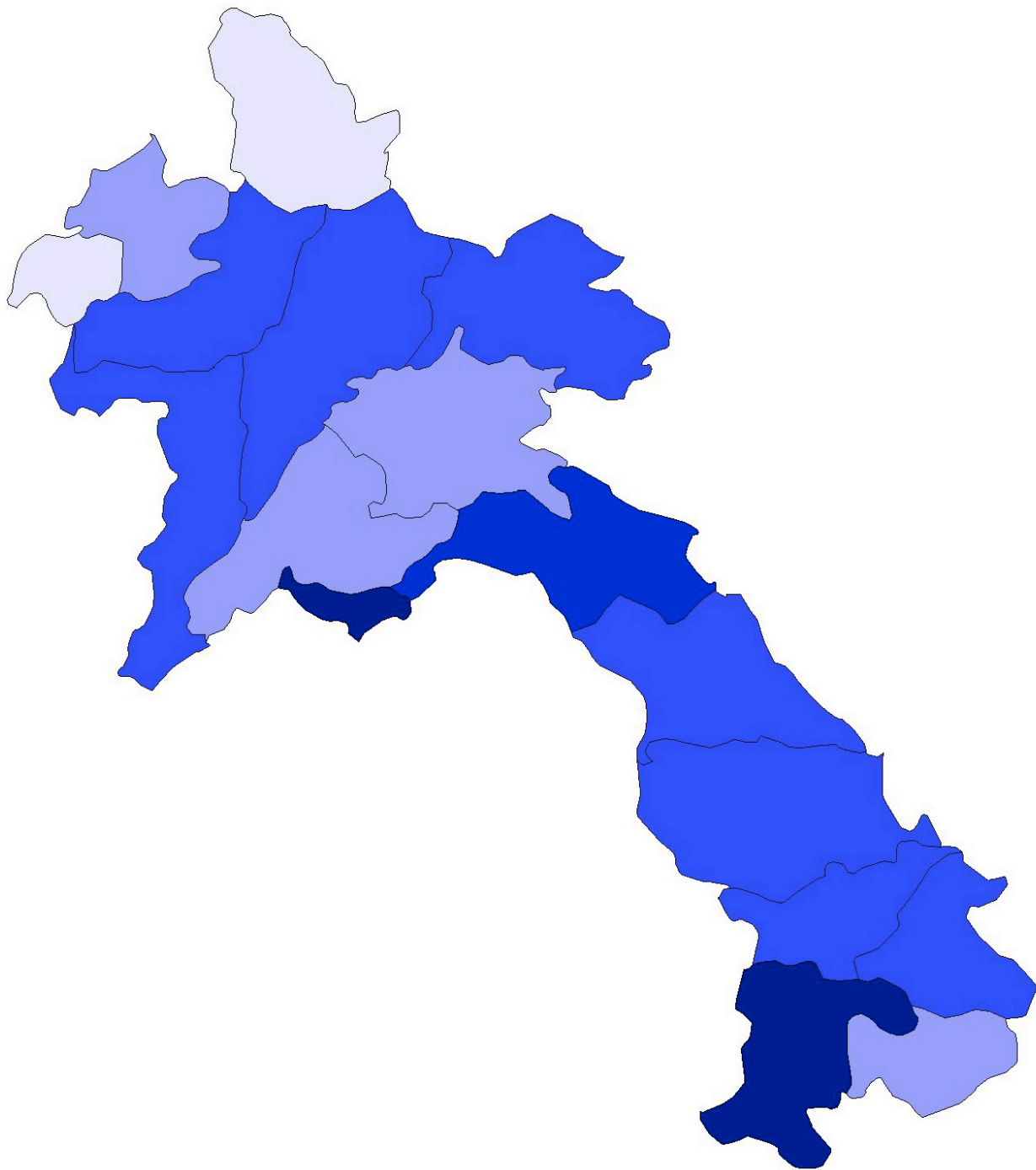
Province	Region	Number of Eligible Households	Total Household Population Based on Sample Weights	Poultry Flock Size (Thousand Head)
Vientiane Capital	Central	98	16,415	808
Phongsaly	Northern	9	665	532
Luang Namtha	Northern	18	1,444	324
Oudomxay	Northern	22	3,283	834
Bokeo	Northern	6	416	433
Luang Prabang	Northern	23	2,438	1,374
Houaphanh	Northern	29	2,135	1,758
Xayabury	Central	22	2,632	1,781
Xiengkhuang	Central	19	1,841	800
Vientiane.M.	Central	20	2,665	1,557
Borikhamxay	Central	34	4,230	654
Khammouane	Central	30	3,775	629
Savannakhet	Central	30	6,673	2,007
Saravane	Southern	23	2,017	2,378
Sekong	Southern	24	1,318	553
Champasack	Southern	42	7,887	3,656
Attapeu	Southern	14	1,114	375
Xaysomboon SR	Central	1	34	N/A

Figure 5: Map of Provinces with Most Eligible Households (Category 1)



Light Pink = Least Eligible Provinces, Maroon = Most Eligible Provinces

Figure 6: Map of Provinces with Most Eligible Households (Category 1 & 2)



Light Blue = Least Eligible Provinces, Dark Blue = Most Eligible Provinces

In general, our results find that provinces with large populations of lowland subsistence farmers would be the most eligible for microfinance loans for poultry production. Under the first eligibility category, the Champasak, Savannakhet, Khammouane, and Borikhamxay provinces all had large numbers of eligible households. These provinces are home to a large amount of smallscale farmers that operate along the Mekong corridor and are close to the large urban markets of the Vientiane Capital, Savannakhet, and Pakse. Furthermore, road access along the Mekong corridor is significantly better than other parts of the country and thus farmers in these provinces have a real opportunity to increase commercialization rates and provide products for the urban centers.

This argument is further strengthened when we consider that Savannakhet and Champasak are home to the largest poultry populations in Lao PDR. Smallholder poultry production is ubiquitous in these provinces and the vast majority of households raise at least one species of birds. These provinces are also home to a large amount of poor farmers in terms of absolute numbers, and thus encouraging subsistence oriented smallscale farmers to market their products can have a tremendous impact on improving livelihoods. Financial access may be the catalyst these farmers need to move from low value home consumption to high value urban markets.

When we relax our criteria, the story is essentially the same, but it expands our eligibility to a larger number of households. Therefore as financial resources become more available, the second eligibility category can be an important tool for identifying provinces where expanding financial services would be most beneficial. The second eligibility category significantly increases the number of eligible households in the Vientiane Capital, which may be a result of higher levels of financial access in this province and thus a larger amount of borrowing households to draw from.

7. Conclusion

Previous research on rural financial access demonstrates how limited formal and semiformal financial channels are for households. Our own survey work reinforces these findings and adds to these challenges by identifying capital constraints among actors in the smallholder supply chain. We find that credit constraints are widespread in Lao PDR, particularly among smallholders. Therefore we find that for smallscale producers, financial resources are not only limited, but also when they do exist many producers face capital constraints and are unable to reap the benefits of capital markets.

Financial markets in Lao PDR, as in other developing countries, are severely limited and as a result poultry producers have a hard time acquiring capital to increase flock sizes, restock in disease outbreaks, or invest in improving product quality. As a result most smallscale poultry producers are trapped in a subsistence system where production can only satisfy household requirements.

Understandably providing capital to rural areas and smallholder farmers presents a huge challenge not only logistically, but also in terms of resources. Therefore we attempt to identify households and regions that we believe can benefit the most from increased financial services to poultry producers. Extending limited financial resources to these households and regions first presents an opportunity to target those who stand to utilize resources most effectively.

Using this approach we conclude that the provinces spanning the central and southern Mekong corridor are the most likely to benefit from MFIs targeted towards smallholder poultry producers. These areas have a large amount of lowland farmers that would be ideal to utilize capital to expand production to meet the urban markets of Vientiane, Savannakhet, and Pakse.

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