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Micro Contracting and the Smallholder Poultry Supply Chain in Lao PDR

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Mekong Region Report

1. Introduction

With a predominately rural population engaged in subsistence agriculture, the contribution of poultry to livelihoods can be instrumental in Lao PDR. However sales amongst smallholders are limited due to a variety of access barriers that deter rural producers from participating in higher value urban markets. These included, but are not limited to, transport costs, search costs, the nature of sales (often in times of emergency) and information asymmetries that reduce the likelihood of smallholders direct participation in downstream markets and supply chains.

To support evidence-based solutions to these market failures survey work was conducted in Lao PDR through December 2009 to July 2010. Market chain questionnaires were implemented in five provinces and include detailed producer, trader, and vendor surveys. Data from questionnaires provide a supply chain audit demonstrating how the smallholder supply chain functions and indicate where failures occur.

Additionally information was collected on the role of informal contracting systems. In industrial poultry supply chains, contracting schemes have proven successful in allowing producers to link directly to vendors, increasing both the quality and value of products. However, in a smallholder system, conventional contracts are not logical given their complexities, high commitments, and rigid structures. Yet adapting a contract system to smallholder systems remains attractive because it could help reduce the inefficiencies found in the poultry supply chain. Here lies the role of micro-contracts; types of informal agreements that allow more flexibility than a formal contract system yet allow producers to link directly to vendors. Micro-contracting presents a potential solution to the market failures that arise in the smallholder poultry supply chain and are worthy of further examination.

2. Background

2.1 Lao PDR Poultry Sector

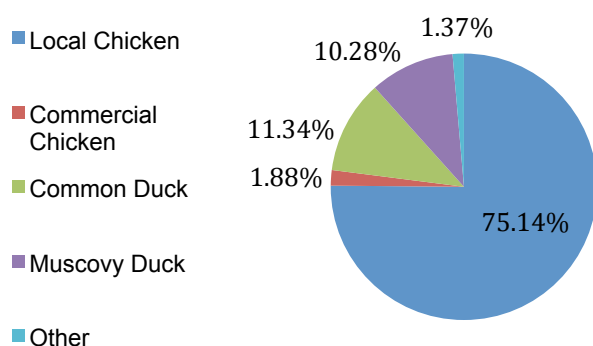
Smallholder production in Lao PDR is dominant representing 94% of all agricultural outputs (Wilson 2007a). Almost nearly as widespread is poultry production, with 90% of households keeping at least one species of bird (Wilson 2007b). Lao PDR has an estimated 20.5 million birds in its national flock, comprised of approximately 77% chickens and 22% ducks (Table 1 and Figure 1). Looking at the national poultry flock by type of bird demonstrates that local birds, especially local chickens, represent the vast majority of birds. However it should be noted that number of commercial birds are under-represented, as the estimates on the national flock by bird type are drawn from a household survey and large commercial farmers were not represented in the data. To gauge the size of the commercial production system we must therefore look at the distribution of the poultry population by production system, which can be seen in Figure 2.

Table 1: Poultry Population and Density by Province, 2007

	Poultry Population (Thousands of Birds)	% of Total	Poultry Density (Birds per Sq KM)	Birds per Person
Lao PDR	20,453	100%	86.4	3.5
<i>Luang Namtha</i>	324	1.6%	34.7	2.1
<i>Phongsali</i>	532	2.6%	32.7	3.1
<i>Oudomxay</i>	834	4.1%	54.3	3.0
<i>Vientiane Capital</i>	808	4.0%	206.1	1.1
<i>Savannakhet</i>	2,007	9.8%	92.2	2.3

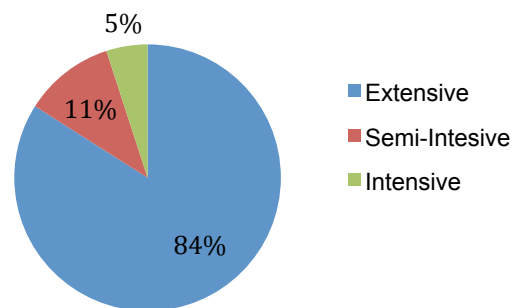
Source: MAF, 2008
(Survey Provinces Listed)

Figure 1: Estimates on National Poultry Flock by Type, 2007/08



Source: NSC, 2009

Figure 2: Poultry Population Distribution by Production System, 2006



Source: NSC, 2008

2.2 Poultry Production Systems and Supply Chain

Officially the Department of Livestock and Fisheries (DLF) only separates production between backyard and commercial systems and reports there are some 800,000 birds raised in a commercial system, which represents approximately 3.8% of the national flock (DLF, 2009). However, it is more accurate to disaggregate production systems further into one of the following three categories: 1) traditional, small-scale, extensive backyard poultry production, 2) semi-intensive, small- to medium-scale, market-oriented, commercial poultry production, and 3) intensive, large-scale, industrially-integrated poultry production. As the DLF lumps semi-intensive production with traditional backyard systems, only estimates are available on the distribution of birds by this classification of production systems, which are found in Figure 2.

2.2.1 Extensive Production

Traditional backyard systems are the primary production method and account for approximately 84% of the national poultry flock. This production method is common throughout the country in both urban and rural areas, and it is especially favored 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). 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, farmers can simply sell their products themselves in effect acting as vendors. This commonly occurs if the producer regularly operates as a vendor or if they sell products to neighbors. 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. Aggregators are a unique feature of the smallholder poultry supply chain and owe their existence to a production system where traders have to buy from numerous sources to obtain a satisfactory bundle of goods for sale.

2.2.2 Semi-intensive Production

Semi-intensive production systems are often lumped into traditional backyard systems, but with larger flock sizes 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.

2.2.3 Intensive Production

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 include 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. Furthermore, infrastructure and technical knowledge is also sourced from Thailand, and these farms operate very similarly to CP contract farms in Thailand. CP is by far the strongest branded commercial poultry product, even with unique Lao packaging. CP products are commonly found in traditional wet markets amongst vendors of indigenous products. In total, the DLF reports there are 193 commercial farms split between broiler chickens (4), layer chickens (112), layer ducks (52), and quail (25). Most of these operations are found in or around the large urban areas of Lao PDR, with the majority (61%) located in the Vientiane Capital (DLF, 2009).

3. Smallholder Poultry Supply Chains: Evidence from Lao PDR

Throughout the GMS, the smallholder poultry supply chain is nearly indistinguishable. In general, it can be described as the marketing and sales of poultry products between three actors: producers, traders, and vendors. Questionnaires were specifically tailored to capture the differences between these actors and reveal how each group contributes to the marketing of poultry products.

3.1 Producer: Rates of Marketing

Poultry farmer surveys consisted 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 semi-intensive producers households and are applicable for both meat and egg production.

Before birds can enter the supply chain, we must first examine the producer's decision to market their products. Looking at smallscale production first, it can be seen that sales of poultry products are limited, especially in Vientiane where the majority of producers reported not selling any birds. Sales were more common in the North and Savannakhet, but even in these regions more than a third of all producers do not sell their products.

Table 2: Percent of Smallscale Producers Who Sold Poultry in the Previous Year

	Vientiane		North		Savannakhet	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Sales	439	41.9	277	66.4	282	56.0
No Sales	608	58.1	140	33.6	222	44.0

Furthermore we find that even when smallscale producers do sell products, sales are infrequent, with the vast majority of producers reporting selling birds less than once a month. Sales are infrequent among smallholder producers for several

reasons. First, smallholder poultry production is primarily for consumption or a mixture of consumption and sales. Thus, production is subsistence oriented and sales only occur if a household's nutritional requirements are met. Second, limited flock sizes mean that producers only have a small amount of birds that can be sold at any given time. Unlike large production where birds are raised in batches so that sales can occur frequently, smallscale producers raise small amounts of birds continuously. Finally, for many smallscale producers marketing channels are limited to aggregators because search costs for buyers are too high. This means that in many cases sales only occur when a buyer approaches a farmer.

Table 3: Frequency of Sales (Percent of Smallscale Producers)

	Vientiane		North		Savannakhet	
	Chicken	Duck	Chicken	Duck	Chicken	Duck
Daily	0	0	0	0	0	0
Weekly	0.3	0.3	0.7	1.5	0	0
Every 2 Weeks	0	0.7	0.7	0	0.4	0
Monthly	9.8	10.7	12.9	4.4	0.7	0
Less Than Once a Month	90.0	88.3	84.9	94.1	98.9	100

Conventional logic may predict that urban producers sell more of their products due to higher market access rates but our data does not demonstrate this. On the contrary we find that marketing is more common amongst rural smallscale producers in the North and Savannakhet and only slightly more common for urban producers in Vientiane. One possible explanation for this phenomenon is that the traditional smallholder supply chain is based on aggregators combing the surrounding rural areas outside of urban centers where poultry production densities are higher and it is easier to obtain a marketable quantity of goods.

Table 4: Percent of Smallscale Producers Who Sold Poultry in the Previous Year (Urban/Rural)

	Vientiane		North		Savannakhet	
	Urban	Rural	Urban	Rural	Urban	Rural
Sales	42.7	41.9	58.7	69.0	30.8	61.5

No Sales	57.3	58.1	41.4	31.0	69.2	38.5
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Large producers have much higher levels of marketing and monthly sales are common although there is a great variation in sales between months. Large chicken producers that raise birds for meat sell an average of 2 to 372 birds per month, depending on the season. Although some large producers sell birds every month, it is more common for producers to sell birds periodically, and thus there are clusters of sales explaining the large variations. Furthermore sales have a distinct temporal nature with the highest sales months occurring during the festival seasons especially in April and November. Variation in egg sales is from how many active layers are currently in the flock and the rates of production of those birds. For example in the North there are a few months where the large egg producer's produced no eggs because their new batch of layers were not producing eggs yet.

Table 5: Average Monthly Sales Quantities of Large Producers

	Vientiane		North		Savannakhet	
	Low Season	High Season	Low Season	High Season	Low Season	High Season
Chickens	138	372	2	728	2	81
Chicken Eggs	27,890	46,009	0	17,676	5,750	8,520
Duck	8.3	27.3	0	66.7	16.7	101.7
Duck Eggs	4,105	4,264	.	.	.	.

3.2 Producer: Marketing Channels

When a smallscale producer does sell their products they reported selling them through four different channels: aggregators, market vendors, households and other farmers, or to restaurants and food vendors directly. Enumerators asked respondents to list what percent of birds and eggs were sold through these channels and the averages are listed in Table 6. Across all regions, aggregators represent the single largest share of sales, although there are important differences between regions. In Vientiane we find that most smallscale producers actually arrange sales on their own; either selling directly to end users or market vendors. In the North and Savannakhet however the role of aggregators is much

larger, and selling to neighbors is less common. This is likely because less people in Vientiane raise poultry, as it is a more developed and urban economy than the other regions where smallholder poultry production is more prevalent. Therefore, producers in Vientiane have a larger marketing channel through direct sales to their neighbors who do not raise birds.

Table 6: Marketing Channels of Smallscale Producers (Average Percent of Sales)

	Vientiane		North		Savannakhet	
	Chicken	Duck	Chicken	Duck	Chicken	Duck
Aggregator	40.9	44.3	57.8	37.6	59.3	67.7
Market Vendors	20.0	17.8	24.8	31.3	22.1	22.0
Households/ Other Farmers	35.2	33.7	14.6	21.6	17.3	14.9
Restaurants / Food Vendors	0.4	0.2	2.9	10.3	0.1	0.
Other	3.3	3.6	0	0	1.5	1.9

For large producers, sales to aggregators and vendors are more common. This reflects the fact that production is commercially oriented and is intended for consumers at markets. Thus large producers are more likely to rely on traders or arrange sales directly with vendors.

Table 7: Marketing Channels of Largescale Chicken Producers (Average Percent of Sales)

	Vientiane		North		Savannakhet	
	Meat	Eggs	Meat	Eggs	Meat	Eggs
Aggregator	58.2	67.9	51.1	60	61.7	70
Market Vendors	19.6	19.8	35	35	37.7	16.6
Households/ Other Farmers	19.7	3.1	11.7	5	0.6	13.3
Restaurants / Food Vendors	0.4	3.8	2.2	0	0	0
Hatchery	0	2.4	0	0	.	.
Company	0	0	0	0	0	0
Other	2.1	2.9	0	0	0	0

3.3 Aggregator

Moving down the supply chain to aggregators, survey data can illustrate the role aggregator's play in smallholder poultry marketing. Aggregators typically trade with numerous sources and a trader may routinely visit several different villages and purchase birds from many different farmers within the villages. This is especially true for traders who source from small farmers as they can only buy a few birds from each source. Thus they must aggregate birds from many sources to obtain a marketable quantity of goods for sale. We find a large variation in the data regarding the number of sources aggregators trade with per month. In Vientiane, aggregators purchased birds from 12 sources on average and sold to 9, while aggregators in other regions purchased from approximately 3.5 sources and sold to 1.5.

Table 8: Average Number of Sources Traded with per Month

	Vientiane		North		Savannakhet	
	Mean	SD	Mean	SD	Mean	SD
Buy	12.1	27.2	3.5	1.5	3.4	1.6
Sell	9.2	24.6	1.6	1.0	1.5	1.2

Aggregator's primarily source from smallscale farmers, however there are differences between regions. In Vientiane, aggregators source exclusively from small farms (less than 100 birds) and other traders. Traders in Vientiane were the most likely to source from small farmers overall and may explain why they purchase from more sources on average than traders in other regions. Aggregators in the North were the only group in our sample to source from largescale farms, however data from largescale producers show that aggregators are the largest marketing channel across all regions and therefore these aggregators were missed in our sample. In Savannakhet, aggregators were the most likely to source from other traders and over 25% of purchase on average come from this source.

Table 9: Source of Poultry Products

	Vientiane		North		Savannakhet	
	Chicken	Duck	Chicken	Duck	Chicken	Duck
Smallscale farms (<100 birds)	88.4%	89.0%	77.3%	76.6%	65.8%	63.9%
Largescale farms (>100 birds)	0%	0%	6.8%	7.1%	0%	0%
Commercial Farms (>1000 birds)	0%	0%	0%	0%	0%	0%
Other Traders	11.5%	11.0%	10.5%	11.1%	28.3%	27.8%
Vendors	0%	0%	5.1%	5%	5.8%	4.8%
Other	0%	0%	0	0%	0%	3.5%

Looking at reported buying and selling quantities reveals some important characteristics despite large discrepancies in data. 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. Our data also 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, as this data only examines producers who trade these products and thus accounts for the fact that more aggregators trade chicken than duck.

Sales quantities show that the reported buying and selling margins do not always add up. This could occur for a variety of reasons. First, aggregators may purchase more birds than they sell and keep the birds for later dates. It is common for aggregators to keep birds overnight and 70% said they routinely do, keeping birds for 1 to 7 days at a time. Secondly, aggregators may want to underemphasize the amount of birds they sell in fear that if their revenues are too large they may be subject to tax and inspection. Although enumerators stated they were working with the National University of Lao PDR and the FAO, many respondents can still be skeptical. Finally, there is likely a large amount of human

error both from the respondents and enumerators. In theory, a good enumerator should catch any large discrepancies between the reported buying and selling quantities, but in practice this is not always the case. Additionally, many aggregators may not readily know these numbers off the top of their heads and simply provide loose estimates.

Table 10: Average Amount of Products Purchased Per Week

Chicken	Vientiane		North		Savannakhet	
	Low Season	High Season	Low Season	High Season	Low Season	High Season
Meat	139.3	180.2	102.5	155.3	141.6	246.2
Layer	10	16.4	0	0	0.1	0.1
Male (breeding)	2.1	3.2	0	0	6.7	11.4
Chicks	16.6	16	0	0	2.7	2.2
Eggs	0	0	34.1	45	0	0
Fertilized Eggs	0	0	0	0	0	0
Duck	Vientiane		North		Savannakhet	
	Low Season	High Season	Low Season	High Season	Low Season	High Season
Meat	81.6	107.8	72.6	114.1	53.5	111.8
Layer	10.7	18.1	0	0	0.3	0.2
Male (breeding)	6.1	10.2	0	0	2.8	15.7
Chicks	3.8	3.8	0	0	4.5	3.6
Eggs	0	0	41.1	52.1	0	0
Fertilized Eggs	0	0	0	0	0	0

Table 11: Average Amount of Products Sold Per Week

Chicken	Vientiane		North		Savannakhet	
	Low Season	High Season	Low Season	High Season	Low Season	High Season
Meat	56.9	119.7	32.6	46.8	145.8	216.4
Layer	4.6	12.1	0.1	0.2	0.3	0.1
Male (breeding)	3.6	6.2	0.1	0.1	10.6	11.4
Chicks	11.5	13.3	0	0	3.3	2.2
Eggs	0	0	29.5	40.9	0	0
Fertilized Eggs	0	0	0	0	0	0
Duck	Vientiane		North		Savannakhet	
	Low Season	High Season	Low Season	High Season	Low Season	High Season
Meat	73.3	51.3	21.9	32.9	55.8	116.0
Layer	12.3	18.3	0.1	0.2	0.2	0
Male (breeding)	2.9	5.9	0.1	0.1	3.0	16.4
Chicks	2.9	4.1	0	0	4.8	3.8
Eggs	0	0	36.6	47.6	0	0
Fertilized Eggs	0	0	0	0	0	0

Aggregators sell to a variety of sources, and there are large differences between regions. For all aggregators, sales to market vendor 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.

Table 12: Marketing Channels, Percentage of Sales, Aggregators

	Vientiane		North		Savannakhet	
	Chicken	Duck	Chicken	Duck	Chicken	Duck
Market Vendors	70.4%	79.5%	43.5%	45.8%	46.9%	59.5%
Consumers	23.5%	14.5%	35.1%	33.6%	11.4%	12.7%
Restaurants/Shops	1.2%	1.5%	10.1%	11.4%	18.6%	8.2%
Other Traders	5%	4.5%	11.0%	9.5%	10.9%	4.5%
Poultry Farmers	0%	0%	0%	0%	6.6%	5.9%
Other	0%	0%	0%	0%	5.7%	9.1%

3.4 Market Vendors

Vendors represent the final link of the supply chain and again survey data provides information on how these actors contribute to the marketing of poultry. Purchases from aggregators are the largest source of birds for vendors across all regions, where birds are either purchased at the market or the vendor's home and again the importance of aggregators in supply chain can be seen. Purchasing birds directly from a farm was also common, especially for duck vendors. This occurs either when a vendor buys from several farmers in a village (in effect acting as an aggregator) or farmers deliver birds to the market. Sourcing from a company was most common among chicken vendors in Vientiane as many vendors sell CP products. Vendors in the North also sourced from a company with 4 vendors reporting they sourced 100% of their products from a Chinese company.

Table 13: Marketing Channels, Percentage of Purchase, Market Vendors

	Vientiane		North		Savannakhet	
	Chicken	Duck	Chicken	Duck	Chicken	Duck
Trader delivers to market	36.8	39.7	37.4	35.4	51.8	51.7
Trader delivers to home	9.8	23.1	18.0	17.6	12.7	5.5
Directly from farm	13.6	19.4	23.9	24.0	21.1	29.7
Other market vendors	5.7	11.1	8.0	8.8	4.5	5.2
Own Flock	0.2	1.1	0.2	0.2	0.7	1.0
Company	34	5.6	12.8	13.9	4.5	0
Other	0	0	0	0	4.5	6.9

Looking at purchase and sales quantities, we only take the averages of vendors that trade that product. Vendors that purchase and sell commercial birds in Vientiane have larger volumes than vendors of local birds. In other regions, local bird purchases and sales are larger, or slightly less (except ducks in Savannakhet). Overall, vendors in Vientiane and Savannakhet had larger purchase and sale quantities than vendors in the North.

We find much smaller discrepancies the reporting buying and selling quantities of vendors than we do with aggregators and most vendors sell the majority of their products. Vendors were asked what is done with unsold products and over 86% responded that products were kept for sales the next day. Outside of Vientiane, another common response was to keep products for home consumption.

Table 14: Average Amount of Products Purchased Per Day (Heads/Day, Eggs/Day)

Chicken	Vientiane		North		Savannakhet	
	Low Season	High Season	Low Season	High Season	Low Season	High Season
Commercial	38	64	8.7	12	21	33.9
Local	20	31	9.6	15.6	18.5	40.3
Eggs	843	1,138	56.2	91	0	0
Fertilized Eggs	0	0	0	0	0	0
Duck	Vientiane		North		Savannakhet	
	Low Season	High Season	Low Season	High Season	Low Season	High Season
Commercial	23	57	5.6	9.5	22	45
Local	15	23	6.7	12.5	9.9	36.1
Eggs	645	908	53.3	95	45	55
Fertilized Eggs	0	0	0	0	70	175

Table 15: Average Amount of Products Sold Per Day (Heads/Day, Eggs/Day)

Chicken	Vientiane		North		Savannakhet	
	Low Season	High Season	Low Season	High Season	Low Season	High Season
Commercial	34	51	7.9	10.9	19.2	33.8
Local	20	24	9.4	14.9	18	40.1
Eggs	612	798	114	178	0	0
Fertilized Eggs	0	0	0	0	0	0
Duck	Vientiane		North		Savannakhet	
	Low Season	High Season	Low Season	High Season	Low Season	High Season
Commercial	22	57	5.1	7.6	16.5	43.2
Local	9	16	6.9	12.7	9.9	35.6
Eggs	473	735	48	92.5	45	55
Fertilized Eggs	0	0	0	0	40	50

Looking at sales channels we find that most sales across all regions are to end consumers. Vendors also reported selling to restaurants, traders, and other vendors in varying degrees depending on the region.

Table 16: Marketing Channels, Percentage of Sales, Market Vendors

	Vientiane		North		Savannakhet	
	Chicken	Duck	Chicken	Duck	Chicken	Duck
Home consumers	64.8	61.7	57.6	55	66	73
Restaurants/Shops	9.7	10.7	12.3	11.1	3.3	3.8
Traders	5.0	4.7	10.2	10.3	7.8	10.6
Other Vendors	9.5	7.3	6.6	6.8	1	0.6
Farmers	4.1	2.0	0	0	4.4	0
Unsure	6.5	12.3	13.3	15.7	18.1	12.3
Other	0	0	0	0	0	0

4. Micro-Contracting: Evidence from Lao PDR.

The supply chain data effectively demonstrates that sales of poultry products among smallholders are limited and when they do occur intermediary agents have a large role in the marketing of these goods. It is the prevalence of these intermediary agents that create market failures in the supply chain resulting in reduced product quality, sales, and income from producers.

Asymmetric information is particularly damaging for smallholder producers because it creates problems of moral hazard and adverse selection in the supply chain. Producers have no incentive to invest in the quality of their products as birds are often mixed with others during transportation and sales. This mixing of birds means there is no way for producers to signal products of higher value, and thus producers must default to low value products. On the opposite end, vendors and consumers have asymmetric information about products and are unable to tell high quality products from low quality. Naturally, purchasers of poultry products will expect all birds to be of the standard low value variety, and without a signaling mechanism they have no reliable method of determining otherwise. Not only does moral hazard and adverse selection limit the value of producer's products, but it has ramifications for animal disease as well. Producers have a disincentive to increase biosecurity levels, because again there is no way for them to signal that birds are disease free and healthy. These access barriers and market failures significantly undermine smallholder's potential for income, product diversification, and the savings/investment decisions needed for local economic growth and modernization.

Just as microcredit arose to solve the problem of capital constraints from information failures in financial markets, we see micro-contracts as tool for reducing market constraints in the smallholder supply chain.

4.1 Definition: Micro-Contracting

Unlike other GMS countries where a traditional contracting system is common, Lao PDR has a nascent or non-existent system. Essentially the only outlet for a contract comes from the Thai conglomerate, CP, and these only exist for large, industrial farms. Smallscale producers must rely on loose, oral, informal agreements with aggregators and vendors and we define micro-contracts as any agreements between two performing parties that fall under one of the following categories: a pre-determined time of purchase, a pre-determined price, a predetermined quantity, providing a price discount, pre-payment for future

products, giving credit to the seller, providing a guaranteed market, or gathering products at the farm. These agreements currently exist only in an informal manner, yet we believe by taking these informal agreements and using them to emulate a traditional contract system, the problems associated with the smallholder poultry supply chain can be alleviated.

4.2 Producer

In the current state of the smallholder poultry supply chain micro-contracts are limited. Most notably our data indicates that there are strong regional differences in how producers use agreements to market their products. In Vientiane, micro-contracts were most widely used overall and across different marketing channels, and in total 8.8% of producers reported having an informal agreement for sales. In the North, informal agreements were most commonly used for market vendors followed by end users, and other channels saw no (or virtually no) micro-contracts. In Savannakhet, we find that micro-contracts are essentially unused amongst smallscale producers with only 3 (0.6%) of producers having any sort of informal agreement in place.

Table 17: Percentage of Smallscale Producers with Informal Agreement for Sales

Marketing Channel	Vientiane		North		Savannakhet	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Aggregator	47	4.5	1	0.2	2	0.4
Market Vendor	41	3.9	26	6.2	1	0.2
Households / Other Farmers	55	5.3	15	3.6	0	0
Restaurants / Food Vendors	1	0.1	0	0	2	0.4
Total	92	8.8	29	6.7	3	0.6

Looking at large producers we find that micro-contracts are much more common, especially in Vientiane. Just as smallscale producer data shows, there are strong

regional differences between how producers use informal agreements to market their products. Again producers in Vientiane were the most likely to use micro-contracts with over a fourth of both largescale chicken and duck producers having some sort of informal agreement in place. Large chicken producers in the North were more likely to have an informal agreement than smallscale producers, but the discrepancy between large and small producers is much smaller than Vientiane. No large duck producers in both the North and Savannakhet used informal agreements, although this data is slightly misleading due to the small sample of only 3 observations in each region. Large chicken producers

There are also important differences between large and small producers in how micro-contracts are used in different marketing channels. For smallscale producers we find that informal agreements are most common with market vendors and end users, while large producers most commonly use micro-contracts with aggregators followed by market vendors. This reveals an important distinction about how the smallholder supply chain differs from other supply chains. Although smallscale producers utilize aggregators for a large portion of their sales, informal agreements with this group are rare indicating that networks are informal and fluctuating.

Table 18: Percentage of Largescale Producers with Informal Agreement for Sales

Marketing Channel	Vientiane		North		Savannakhet	
	Chicken	Duck	Chicken	Duck	Chicken	Duck
Aggregator	19.8	17.2	11.1	0	7.1	0
Market Vendor	18.5	6.9	11.1	0	3.6	0
Households / Other Farmers	8.6	6.9	0	0	0	0
Restaurants / Food Vendors	1.2	3.5	0	0	0	0
Total	28.4	31.0	11.1	0	7.1	0

Producers with informal agreements were asked what they entail and the majority of agreements cover a pre-determined time of purchase, price, and quantity. In particular, a pre-determined price was the single most common type of agreement for all producers. Agreements on the timing of sale and the quantity sold were more frequent amongst large producers, which can be expected due to the larger volumes of sales. Price discounts were the next most common type of agreement. Price discounts can be given to buyers to create incentives for future purchases. Furthermore, there is a large bargaining culture in Lao PDR and discounts on most purchased goods are common. Credit, either to the producer through pre-payment for future products or to the seller by only paying for goods that are sold, were relatively uncommon. Producer credit only appeared for large chicken producers and seller credit was only seen amongst smallholders (Table 11)

Table 19: Items Covered By Informal Agreements, Percentage of Smallscale Producers

	Vientiane		North		Savannakhet	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Time of Sale	21	22.8	8	27.6	1	33.3
Price	40	42.5	6	20.7	2	66.7
Quantity	18	19.6	11	37.9	1	33.3
Price Discount	16	17.4	12	41.4	1	33.3
Product Pre-Payment	2	2.2	5	17.2	0	0
Credit to Seller	9	9.8	2	6.9	.	.
Guaranteed Market	3	3.3	0	0	0	0
Provide Inputs	2	2.2	1	3.5	.	.

Table 20: Items Covered By Informal Agreements, Percentage of Largescale Producers

Marketing Channel	Vientiane		North		Savannakhet	
	Chicken	Duck	Chicken	Duck	Chicken	Duck

Time of Sale	39.1	22.2	100	0	50	0
Price	47.8	44.4	0	0	50	0
Quantity	43.5	33.3	100	0	50	0
Price Discount	17.4	44.4	0	0	50	0
Product Pre-Payment	13.0	0	0	0	0	0
Guaranteed Market	21.7	11.1	0	0	0	0
Provide Inputs	8.7	33.3	0	0	0	0

Enumerators also asked producers without an informal agreement for sales what (if any) agreements they would be interested in. Table 12 reveals that smallscale producers are generally less interested in participating in any sort of informal agreements than large producers are. For small producers, the most attractive agreements would be a pre-determined price, time of sale, and quantity as well as guaranteed market. For large producers, the most desirable agreements were predetermined prices and having a guaranteed market. Overall these percentages are quite low for smallscale producers because it includes producers who rarely or never sell and are thus less likely to interested in forming any agreements.

Table 21: Interest in Informal Agreements, Smallscale Producers Without Any (Percentage)

	Vientiane		North		Savannakhet	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Time of Sale	95	10.0	11	2.8	63	12.5
Price	136	14.2	7	1.8	77	15.3
Quantity	95	10.0	6	1.5	66	13.1
Price Discount	37	3.9	6	1.5	15	3.0
Product Pre-Payment	28	2.9	10	2.6	54	10.7

Credit to Seller	85	8.9	12	3.1	.	.
Guaranteed Market	83	8.7	2	0.5	38	7.5
Provide Inputs	61	6.4	18	4.6	.	.

For producers that did not have an interest in informal agreements, enumerators asked respondents to list their reasons. The most common explanation was that the producers preferred to work independently and 62.23% of all producers listed this as a reason. Next most common, was the belief that the contract system is unreliable followed by producers having no person that would agree to an informal agreement. Search costs were the least common reason given, with no large duck producers citing this as a reason (Table 13).

Table 22: Reasons for not wanting to participate in Informal Agreements, Smallscale Producers

	Vientiane		North		Savannakhet	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Contract system is unreliable	96	12.9	166	46.5	31	7.8
Prefer to work independently	436	58.6	277	77.6	218	54.6
Do not have a channel that offers a micro-contract	66	8.9	35	9.8	61	15.3
Do not know who to make a micro-contract with	60	8.1	7	2.0	50	12.5

It is of particular interest is to examine how rates of marketing differ between those with micro-contracting systems and those without. Among smallscale producers, poultry sales are more frequent for those with informal agreements with aggregators and vendors. For end users, marketing levels are similar to those with agreements and those without (Table 14). This can be expected because sales to neighbors and households are more informal channels while aggregators and vendors would have the most potential for informal agreements.

Table 23: Informal Agreements and Bird Marketing Levels, Smallscale Producers with Sales

	Vientiane		North		Savannakhet	
	Agreements	No Agreements	Agreements	No Agreements	Agreements	No Agreements
Weekly	1.1%	0	0%	0.7%	0%	0%
Monthly Sales	13.2%	9.8%	0%	13%	0%	0.8%
Sales less than once a month	85.7%	89.4%	100%	84.9%	100%	98.9%

The survey data reveals that marketing levels are higher for producers with informal agreements, but we cannot make statements about the impact of micro-contracts on marketing rates due to the issues of causality. Again it could be possible that higher levels of marketing lead to informal agreements.

4.2.1 Aggregator

The fundamental aggregator business model is to capitalize on the buying and selling margins of poultry products. Thus it should be expected that micro-contracts are especially appealing to aggregators as it can help formalize and regulate the supply and sales of their products. The data confirms these expectations, as aggregators are more likely to engage in informal agreements than smallholders are. Informal agreements were formed for both poultry product purchases and sales and market vendors were the most common group that vendors had agreements with. Aggregators also formed agreements with farmers and other traders as well, and for these groups, purchasing agreements were much more frequent. Aggregators also reported having informal agreements with consumers, and this group represented the second most common source of micro-contracts for sales.

Table 24: Percentage of Aggregators with Informal Agreement for Purchases and Sales

	Vientiane		North		Savannakhet	
	Purchases	Sales	Purchases	Sales	Purchases	Sales
Farmers	11.1%	0%	0%	0%	11.1%	0%
Other Aggregators	3.7%	0%	0%	0%	5.6%	2.8%
Market Vendors	18.5%	33.3%	0%	2.4%	0%	8.3%
Consumers	.	7.4%	.	2.4%	.	0%
Restaurants/Shops	.	0%	.	0%	.	5.6%

The most common form of agreements formed by aggregators was establishing a pre-determined price and are utilized because establishing clear buying and selling prices before sales occur can ensure profits for aggregators. Next most common are agreements on timing of sales and quantities, which is consistent with the producer data. Price discounts also appear, but are favored less than the other agreements. Credit in any form was not used by any of the aggregators (Table 16).

Table 25: Items Covered By Informal Agreements, Percentage of Aggregators

	Vientiane		North		Savannakhet	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Time of Sale	8	72.7%	1	100%	6	100%
Price	9	81.8%	0	0%	5	83.3%
Quantity	7	63.6%	0	0%	3	50%
Price Discount	2	18.2%	1	100%	1	16.7%
Product Pre-Payment	0	0%	0	0%	0	0%
Credit From Producer	0	0%	0	0%	0	0%
Credit to Vendor	0	0%	0	0%	0	0%
Guaranteed Market	2	18.2%	1	100%	0	0%

Just like the producer questionnaire, enumerators asked enumerators without micro-contracts what informal agreements they would be interested in forming. Establishing a predetermined price was the most desired informal agreement, followed by predetermined quantity and receiving a price discount on purchases. Some aggregators expressed an interest in forming credit agreements, with prepaying for future products being the most appealing (Table 17).

Table 26: Interest in Informal Agreements, Aggregator Without Any (Percentage)

	Vientiane		North		Savannakhet	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Time of Sale	6	37.5%	1	2.5%	2	6.7%
Price	5	31.3%	1	2.5%	2	6.7%
Quantity	5	31.3%	0	0%	2	6.7%
Price Discount	5	31.3%	0	0%	2	6.7%
Product Pre-Payment	1	6.3%	0	0%	0	0%
Credit From Producer	2	12.5%	0	0%	1	3.3%
Credit to Vendor	2	12.5%	0	0%	0	0%
Guaranteed Market	5	31.3%	0	0%	1	3.3%

However, almost 19% had no interest in forming any of the informal agreements listed in Table 17. For these aggregators the desire to work independently was the most common reason given, followed by the belief that a contracting system is unreliable (Table 18)

Table 27: Reasons for not wanting to participate in Informal Agreements, Aggregator

	Vientiane		North		Savannakhet	
	Freq.	Percent	Freq.	Percent	Freq.	Percent

Contract system is unreliable	1	12.5%	29	74.4%	5	18.2%
Prefer to work independently	3	37.5%	35	89.7%	15	55.6%
Do not have a channel that offers a micro-contract	0	0%	3	7.7%	8	29.6%
Do not know who to make a micro-contract with	0	0%	4	10.3%	1	3.7%

4.2.2 Market Vendors

Representing the final stage of the supply chain, market vendors have an essential role to play in the micro-contracting system. Survey data demonstrates that market vendors are most likely to have informal agreements for purchases with aggregators and 42% of respondents claimed they have agreements in place with this group, which is the largest percentage the entire Vientiane Capital data set. Next most common were informal agreements with CP, and 20% of vendors reported having agreements in place. Farmers and other vendors were the least common group that vendors formed agreements with and only 8% of vendors reported having agreements with these groups. Although agreements are the lowest with farmers and other vendors, it still a high percentage compared with other actors in the supply chain revealing how prevalent micro-contracts are amongst vendors.

Table 28: Percentage of Market Vendors with Informal Agreement for Purchases

Marketing Channel	Vientiane		North		Savannakhet	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Farmers	8	8.1%	0	0%	0	0%
Aggregator	37	37.4%	0	0%	1	2.2%
Other Vendors	6	6.1%	0	0%	0	0%
Company (CP)	21	21.2%	0	0%	0	0%
Total	65	65.7%	0	0%	1	2.2%

For market vendors the most common type of informal agreements are establishing a predetermined price, a predetermined quantity and receiving a price discount respectively, which is more or less consistent with the other actors in the supply chain. Agreements on the timing of purchases are less common, which can possibly be explained by the fact that vendors routinely buy products daily and have an expected supply. Agreements on predetermined prices were the highest of all actors in the supply chain with almost 93% of vendors with informal agreements reported having them. This demonstrates how important having clear and consistent input prices are because it allows vendors to control their profit margins more effectively. Agreements on credit either in the form of prepayments, or only paying for products once they are sold were virtually unutilized (Table 20).

Table 29: Items Covered By Informal Agreements, Percentage of Market Vendors

	Vientiane		North		Savannakhet	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Time of Sale	32	49.2%			1	100%
Price	60	92.3%			0	0%
Quantity	51	78.5%			0	0%
Price Discount	38	58.5%			0	0%
Product Pre-Payment	1	1.5%			1	100%
Credit From Trader/Producer	1	1.5%			0	0%
Guaranteed Supply	0	0%			0	0%

For market vendors without any informal agreements vendors were equally likely to want a predetermined time of purchase, a predetermined price, and price discount. Establishing a predetermined quantity was also a popular desire. In general interest in forming micro-contracts among market vendors was higher

than all other actors in the supply chain. In fact, only one vendor expressed no interest in forming any informal agreements (Table 21).

Table 30: Interest in Informal Agreements for Those Without, Percentage of Market Vendors

	Vientiane		North		Savannakhet	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Time of Sale	5	14.7%	5	11.6%	4	9.9%
Price	5	14.7%	4	9.3%	3	6.8%
Quantity	4	11.8%	3	7.0%	3	6.8%
Price Discount	5	14.7%	6	14.0%	1	2.3%
Product Pre-Payment	0	0%	5	11.6%	0	0%
Credit From Trader/Producer	1	2.9%	7	16.3%	3	6.8%
Guaranteed Supply	0	0%	7	16.3%	2	4.6%

Table 31: Reasons for not wanting to participate in Informal Agreements, Market Vendor

	Vientiane		North		Savannakhet	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Contract system is unreliable	1	3.7%	22	64.7%	12	33.3%
Prefer to work independently	1	3.7%	25	73.5%	24	66.7%
Do not have a channel that offers a micro-contract	1	3.7%	4	11.8%	3	8.3%
Do not know who to make a micro-contract with	0	0%	6	17.7%	2	5.6%

5. Conclusion

Market chain data demonstrates the significant role aggregators have in the supply chain representing an essential link between producer and consumers. Aggregators are the most common channel for smallscale producers to sell to

and likewise, aggregators are most likely to source from small farmers. Looking at sales aggregators sell the vast majority of their products to market vendors and thus they provide an undeniable link between producers and end users.

Unfortunately this creates market failures in the supply chain and it should come as no surprise that marketing rates amongst smallholders are so limited. Micro-contracts appear to be a potential solution to the problems of asymmetric information because they could provide a direct link between smallscale producer and vendors. However, our data shows that smallscale producers are the least common group to form micro-contracts. Instead we see that intermediary actors most frequently form agreements. Aggregators and vendors receive their livelihoods from the sales of goods which they do not produce and agreements help ensure their successful profit margins. Using the approach that intermediary agents take by creating agreements to establish prices, quantities and times of sales, it can be expected that smallholders could capture the profits from the margins that intermediary agents exploit.

We believe that micro-contracts can be an important tool for increasing market access rates and reducing market chain failures. Preliminary survey findings support these beliefs, but without testing the causality of micro-contracts on smallholder marketing we cannot make absolute statements. This is one area where a pilot micro-contracting program would be especially useful. In the pilot project, both sample and control groups would be established were the sample group engages in micro-contracts with vendors and/or aggregators. Monitoring and comparing data between the two groups would allow us to determine the causality of informal agreements and marketing.

Another important aspect of a pilot micro-contracting project would be the formal establishment of informal agreements into micro-contracts. As it stands now, informal agreements are loose and unreliable and thus many producers will not use them. We hope to demonstrate that by formalizing micro-contracts we can

create a standard and reliable tool for producers that will help them enter high value urban markets and increase income from their products.

6. References

Burgos, S., J. Otte, and D. Roland-Holst (2008). “HPAI and Livelihoods in Lao People’s Democratic Republic – A Review.” FAO PPLPI Mekong Team Working Paper No. 5

DLF – Department of Livestock and Fisheries of Lao PDR (2009). Private Correspondence.

MAF – Ministry of Agriculture and Forestry of Lao PDR (2008). “Agricultural Statistics Year Book 2007.” May 2008

NSC – National Statistical Center of Lao PDR (2008). “Statistical Yearbook 2007.” June 2008

NSC – National Statistical Center of Lao PDR (2009). “Lao Expenditure and Consumption Survey 2008/09 (LECS 4).” October 2009

Wilson, R. T. (2007a). “Numbers, Ownership, Production, and Disease of Poultry in the Lao People’s Democratic Republic.” *Worlds Poultry Science Journal* 63: 655-663

Wilson, R. T. (2007b). “Status and Prospects for Livestock Production in the Lao People’s Democratic Republic. *Tropical Animal Health and Production* 39: 443-452

7. Annex

Table A1.1: Items Covered By Informal Agreements, Percentage of Largescale Chicken Producers

Marketing Channel	Vientiane		North		Savannakhet	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Time of Sale	9	39.1	1	100	1	50
Price	11	47.8	0	0	1	50
Quantity	10	43.5	1	100	1	50
Price Discount	4	17.4	0	0	1	50
Product Pre-Payment	3	13.0	0	0	0	0
Guaranteed Market	5	21.7	0	0	0	0
Provide Inputs	2	8.7	0	0	0	0

Table A1.2: Items Covered By Informal Agreements, Percentage of Largescale Duck Producers

Marketing Channel	Vientiane		North		Savannakhet	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Time of Sale	2	22.2	0	0	0	0
Price	4	44.4	0	0	0	0
Quantity	3	33.3	0	0	0	0
Price Discount	4	44.4	0	0	0	0
Product Pre-Payment	0	0	0	0	0	0
Guaranteed Market	1	11.1	0	0	0	0
Provide Inputs	3	33.3	0	0	0	0

Table A1.3: Interest in Informal Agreements, Largescale Chicken Producers Without Any (Percentage)

	Vientiane		North		Savannakhet	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Time of Sale	20	34.5	0	0	9	34.6
Price	28	48.3	0	0	9	34.6

Quantity	21	36.2	0	0	9	34.6
Price Discount	7	12.1	0	0	0	0
Product Pre-Payment	13	22.4	0	0	0	0
Guaranteed Market	25	43.1	0	0	1	3.9
Provide Inputs	19	15.5	0	0	0	0

Table A1.4: Interest in Informal Agreements, Largescale Duck Producers Without Any (Percentage)

	Vientiane		North		Savannakhet	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Time of Sale	6	30	0	0	0	0
Price	10	50	0	0	1	33.3
Quantity	7	35	0	0	1	33.3
Price Discount	3	15	0	0	0	0
Product Pre-Payment	4	20	0	0	0	0
Guaranteed Market	11	55	0	0	0	0
Provide Inputs	7	35	0	0	0	0

Table A1.5: Reasons for not wanting to participate in Informal Agreements, Largescale Chicken Producers

	Vientiane		North		Savannakhet	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Contract system is unreliable	9	31.0	4	80.0	0	0
Prefer to work independently	15	51.7	3	60.0	16	100
Do not have a channel that offers a micro-contract	3	10.3	0	0	0	0
Do not know who to make a micro-contract with	5	17.2	1	20.0	1	6.25

Table A1.6: Reasons for not wanting to participate in Informal Agreements, Largescale Duck Producers

	Vientiane		North		Savannakhet	
	Freq.	Percent	Freq.	Percent	Freq.	Percent

Contract system is unreliable	1	25	.	.	.	.
Prefer to work independently	4	100	.	.	.	.
Do not have a channel that offers a micro-contract	4	100	.	.	.	.
Do not know who to make a micro-contract with	4	100	.	.	.	.