

Smallholder Swine-Pig Meat Production in Asia

*A Conceptual Framework for Competitiveness:
using analysis from the Lower Mekong Region¹*



Phil Psilos

Consultant on Value Chain and Private Sector Development
Services

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1. Introduction

This concept note lays out a framework for analysis of the competitiveness of smallholder participation in swine markets in Asia based on research and a review which analyses swine issues in the lower Mekong subregion.

In a separate document, a methodology for competitiveness analysis is presented for Asian smallholder dairy participation. It is based on a hybrid of the *Five Forces* model (as articulated by Michael Porter of Harvard Business School) and on the work of Da Silva in rapid assessment of agri-food value chains. The purpose of this framework is to provide sector stakeholders with a structured way of exploring value chain competitiveness with clear analytical steps and a combination of quantitative and qualitative analysis in order to identify and address key constraints to smallholder success and participation in potentially remunerative markets.

The procedure for analysis of the competitiveness of the swine production “system” (value chain) is substantially similar in the two industries. Using a framework of five issue areas² that allow cross-national comparisons, it proceeds through the identification of key industry issues, weighting of their relevance and controllability by policy and program interventions, identification and diagnosis of the strengths, weaknesses, opportunities, and threats (SWOT) in relation to each issue and in order of their relative importance, and the identification and selection of promising models which, adapted or adopted, could address key constraints and leverage opportunities for smallholder success.

1.1 The case of pigmeat

Small scale dairying and swine raising have several characteristics in common, including their relative accessibility as a savings and investment mechanism, and the creation of multiple benefits to smallholders, not all of which are directly remunerative.

However, smallholder swine producers face a different set of over-riding issues related to market evolution and greater uncertainty about their medium-term prospects and their potential challenges from regional live pig and meat product imports. These issues include the rapid intensification of pig production by integrated firms in Asia and the increasing viability of cross-border trade in live pigs and pigmeat, which is facilitated not only by trade agreements but the relative different structures of markets, demand and supply, in adjacent countries.

With respect to the evolution of their respective markets, smallholder pig producers face different opportunities and challenges than their counterparts raising dairy cows. While high world milk prices indicate clear opportunities for dairying to provide for economic advancement in a variety of rural economic situations, the opportunities for small-scale swine raisers are somewhat less clear, at least in the medium term.

Certainly smallholder swine producers have a peculiar role in simultaneously supporting and undercutting industry formalization in Asia, and face numerous challenges to profitable future participation in markets when confronted with widespread intensification and changes in market structure facing many nations in developing Asia.

2. Economic Context of Smallholder Pig Raising

The smallholder swine industry represents the most basic financial strategy for many rural communities. The “Piggy Bank” exists across cultures as a symbol of responsible financial behavior. This low-return form of savings is still considered economically responsible, and many producers halt production once price signals indicate that swine raising will not be profitable, for

² These issue areas are (1) Factor conditions and utilization; (2) Demand Conditions; (3) Market structure and governance; (4) Value Chain Depth and Related Activities/Industries; (5) Business enabling environment, as adapted from the *Five Forces* model.

example, after gluts or import surges. Dairy producers don't have the same exit-entry flexibility in responding to market changes. In Asia, smallholder pig raising remains a staple of multi-objective rural households, yielding both nutritional financial benefits, as well as providing for conversion of household waste into fertilizer for agricultural crops.

Smallholder pig raising has been remarkably resilient over time, as it was in developed countries where pigs were often raised on small/medium sized farms until a few decades ago. In Thailand, during the Asian Financial Crisis of 1997-2000, smallholder activities in pig fattening (the major way smallholders participate in the market) fell to near zero³, and was predicted to be "over" as a form of village-level economic activity. Yet, in 2007, Thai industry executives and livestock association managers reported separately that smallholder fattening activities represent up to 25% of total swine output.⁴ Vietnam's recent experience with FMD was exacerbated by a move by producers out of smallholder poultry production and into swine raising following the Avian Influenza crisis in 2004, and recent reports suggest that despite the country's ongoing battle with PRRS, smallholders continue to raise swine. Many smallholders who had abandoned swine raising during import surges in Cambodia during 2005- early 2007 also re-entered the small-scale production arena with temporary import protection provided by a government embargo on imports.

Smallholder pig raising may also be an important point of entry into commercial livestock activities, as costs related to scaling up of operations can be relatively manageable, particularly where land resources are owned and feed inputs are available locally at reasonable prices. Yet, in some parts of the Mekong sub-region, the appropriate technical and veterinary supports, institutional and marketing structures, and credit and finance tools are not yet in place to support this transition. In addition, important changes in developing markets raise doubts about the viability of smallholder participation in industry upgrading.

The key question is not whether semi-commercial smallholders will continue to attempt to produce swine, but whether they can do profitably when confronted with a significant move towards (1) integrated production in the region by large producers and their contract farming systems, which is related to; (2) the growth of supermarket and cold-chain dependent distribution strategies that displace traditional marketing chains to the disadvantage of small producers; (3) shifting urban consumer preferences which increasingly favor lean pork meat produced by hybrid and exotic breeds rather than traditional, high-fat local breeds. These changes are exacerbated by the opening up of cross-boundary markets as a result of policies and road infrastructure investments, which facilitate the movement of animals and of (4) animal diseases, which pose significant threats to both herds and markets. Combined with chronic weaknesses and quality constraints in the marketing chain—the abattoir sector in particular—these pressures, are reshaping the landscape in which smallholders operate and will exert growing pressure on smallholder pig-raising activities to re-define their participation in Asian markets or accept declining financial returns with significant impact on rural capital accumulation.

2.1 Changes in demand conditions accompanying urbanization and supermarket growth

Two inter-related factors driving changes in demand conditions for smallholder-produced pigmeat are the changes in product demand, favoring lean pork, wrought by urbanization and rising incomes throughout Asia, and the concomitant growth of modern supermarkets throughout rapidly urbanizing developing country markets.

³ Thavajchai Sakpuaram, Suwicha Kasaemsuwan, and Preeyaphan Udomprasert, *Swine Industry Farms in Thailand*, in *ACIAR Working Paper No. 53: Priorities for pig research in Southeast Asia and the Pacific*, March 2002.

⁴ Confidential interview with Thai industry sources, Bangkok, September 2007

1) The first condition tends to reduce the returns on traditional pig raising, since local breeds in some markets generally yield lower percentages of lean meat and are therefore less attractive to traders/middlemen/collectors/wholesalers, to the extent that they are involved in distribution to wealthier urban markets. In Cambodia, farm gate prices for “fattier” local breeds is discounted by approximately 35% when higher yielding alternatives are available in the market, and middlemen and traders criticize pig raisers for their unwillingness to adapt to new requirements of the marketplace. Cambodia’s swine import embargo in place from late 2007 to mid-2008 in response to animal disease outbreaks in Vietnam can also be perceived as a strategy to protect these uncompetitive domestic producers from higher quality pig imports, with high lean meat ratios, that have flooded the market in recent years.

2) The second condition—that of supermarket growth in developing Asia—implies a much greater shift in the marketing chain for pigmeat, and smallholders (particularly those outside of peri-urban areas) tend to be limited in their ability to meet product quality, reliability of production/delivery, and proximity requirements. This severely limits their access to marketing chains that feed the growing supermarket sector.

The requirements of modern supermarkets—standardized product quality, traceability, and hygiene standards, and absolute need for reliable and predictable supply—are among the most important governance forces transforming the swine marketing chain. This force strongly favors large-scale integrated producers or well-orchestrated contract farming arrangements, both of which are (effectively) vertically integrated modes of pig-raising. As these production-distribution-retail systems become more deeply embedded in the growing urban areas of Asia, small producers will face progressively limited opportunities to access mainstream domestic markets. In pig exporting countries, no clear role for smallholders in mainstream export-oriented production has been articulated (nor realistically envisioned).

In the context of these changes, the weaknesses of the abattoir sector throughout Southeast Asia will also become more of an obstacle for smallholders, especially since more affluent consumers are increasingly accustomed to the quality guarantees provided by store-branded pork products. The role of both private and contract slaughterhouses throughout the region as the value chain’s regional-level orchestrators is clearly being replaced in more developed (urban) markets by retailers, while peripheral (provincial and rural) markets remain poorly served by low-quality, unhygienic, and technologically obsolete slaughter operations. Substandard abattoir practices impact both consumers, whose hot-market purchases are typically handled in a variety of unsanitary, risk-producing conditions, and producers, who receive lower prices for carcasses that will be slaughtered inefficiently, resulting in loss of product. Reports from provincial markets in Thailand, Cambodia, and Vietnam are strikingly similar in their reports on these abattoir-related issues and challenges.

Intensification of production will not be treated as a separate factor with respect to market conditions, but instead will be addressed with respect to the “orchestration” role of lead firms in regional value chains, with an emphasis on both the potential opportunities created by strong lead firms’ producer-oriented strategies, and the barriers to access that these same strategies may create or aggravate for smallholders.

2.2 Smallholder economic rationality and industry development

Because smallholders tend to lack access to market information and understanding of price cycles, their entry and exit from production markets is predictably pro-cyclical. This behavior—raising more pigs when prices are high and fewer when prices are low—actually maintains price stability, but denies larger and better organized producers entrepreneurial (or monopoly) rents, at least to the extent that the main pork market products remain undifferentiated with respect to brand and quality. In Thailand, branding strategies by CP and Betagro and shifting urban distribution channels (supermarkets) are beginning to change this equation, but most rural and small-city consumers remain outside of the reach of these initiatives.

Industrial producers appear to be most sensitive to gluts (oversupply) which drive farm gate swine and retail pork prices down and create uncertain profit conditions. In particular, industrial producers in non-differentiated production systems risk losing market share when small producers enter the market. This has made larger-scale capital investments, where predictability of revenues and output are critical factors for planning, more risky for commercial and industrial producers, particularly in less developed markets including Cambodia and Laos PDR.⁵

Producers' associations are used in Thailand to assist in reducing gluts by providing producers with market information (forecasts) and voluntary herd reductions. But these associations tend to involve producers above a certain scale (in Thailand, the minimum 450-750 head range, which also appears to be the minimum the threshold for participation in Thai contract farming). These associations, whose interest is in maintaining higher prices, also risk functioning as cartels, and may be anticompetitive in their supply-reduction behaviors. Unless producer association members' interests are well-aligned, it is difficult to prevent at least some members from overproducing.⁶

For the Cambodian market, where integrated/industrial scale production is in its infancy, accounting for only 4% of swine production in 2006,⁷ the combination of cyclical entry and exit of smallholders and surges of illicit imports are doubly troublesome for advanced industry development. Rising demand leads more organized market participants (those with greater capital needs and technical capacity such as breeders and feed mills) to scale-up production in anticipation of market growth. However, import surges create supply that is not linked to these domestic capital investments. Repeated surges of imports at times of anticipated high farm gate prices have led to oversupply and falling prices, with small producers exiting the marketplace and productive capacity of more capital-intensive value chain segments (breeders, feed producers) rapidly becoming underutilized and unprofitable.

2.3 Contract farming and Lead Firm Market Integration Strategies

Lead firms operating at the national and regional scale throughout Asia exert significant power in value chains that are increasingly governed by product quality requirements of supermarkets and other organized processing-wholesale-retail entities. Lead firm production strategies vary somewhat, but many adopt a fully integrated strategy—particularly domestic and international firms operating in Vietnam, some Taiwanese firms operating throughout Asia, and many in China PRC. The issue of contract farming is another key element in lead firms' strategies that may offer both challenges and opportunities for smallholders, exerting significant influence on the value chain contexts in all countries where it is in practice.

The contract farming system in widespread use in Thailand, and growing in popularity in Vietnam, represents an asymmetric but mutually beneficial compromise between mid-scale pig raisers and industrial producers/processors. Independent producers gain access to skill, technology, and (in some cases) guaranteed markets. Facilities investment and labor supervision is transferred to small producers by integrators. In some contract farming arrangements, producers buy feed, medicine, veterinary services, and piglets from integrators without a guaranteed price (CP Thailand model), while in others these inputs are provided and the contract price represents a relatively simple subcontract (Betagro Thailand model).

In either case, by controlling the number of contracts issued during a particular period, integrated producers can neutralize the risk of gluts to some extent, but only to the extent that poorly

⁵ There is little evidence that this dynamic holds in the much more active Vietnamese market, and the extent to which this case acts as a counter-example should be further investigated, although the sheer strength of demand in the Vietnamese market may overwhelm this concern.

⁶ Furthermore, there is an extensive economic literature describing the "prisoner's dilemma game" of compliance with voluntary limits on production.

⁷ SLPP Livestock Marketing in Cambodia, 2006/7 p.22.

informed smallholders can be persuaded not to over-supply the market. Yet smallholders are responding correctly to market signals, though their price expectations may not be met when the time comes for selling finished pigs. Clearly, the elimination of the predictably pro-cyclical smallholder swine farmer is in the short- and long-term financial interest of large integrators, and 2006 protests by Thai swine farmers, provoked by CP Thailand's alleged undercutting of farm-gate swine prices, demonstrates the volatility of this situation.

Numerous NGOs and livestock organizations are exploring ways to improve the possibilities for small producers' participation in contract farming arrangements, and on more favorable terms. This has been a particular focus of research in Vietnam during the past several years, where intensification, rapid modernization of the industrial production sector, and evolution of the marketing chain has threatened to displace smallholders the most.

2.4 External Risks: Trans-boundary animal disease (TADs) and environmental sustainability

Livestock intensification around Asia has also heightened the risks (both in terms of probability and severity) of the spread of trans-boundary animal diseases. Continental Southeast Asia is increasingly linked to other parts of Asia through both regulated and unregulated livestock trade. A virulent strain (serotype) of FMD traveled on a disease pathway between provinces in Southern China and Southern Vietnam, leading to one minor, and one severe, Vietnamese "market collapse," in 2005 and 2006-2007, respectively. At present, Vietnam is working to combat PRRS, which also apparently reached the country's denser swine production regions through the same pathways.

PRRS, in particular, highlights the significant economic and health risks of TADs in a region where industrial-scale swine production is nascent, fast-growing, has limited bio-security and is relatively uncontrolled. To the extent that large-scale production continues to grow rapidly, smallholders are also at risk of significant direct and indirect financial losses. Small producer herds may be infected by direct or indirect contact with infected animals, through introduction of exposed gilts into herds, or through less direct modes of exposure. Indirect losses can result from disease-related market-collapses resulting from public fear of TADs, from erosion of the supporting industry base resulting sequential TAD outbreaks, and from capital providers' aversion to livestock markets resulting from outbreaks.

2.5 Smallholder Capacity Limitations

Smallholders throughout the region are threatened by inability to adapt to these changing market conditions and requirements, and to respond to threats in their livelihoods. Better-yielding breeds are frequently beyond the (limited) technical capacities of smallholder producers because of their inferior disease resistance, and more demanding and expensive feed requirements. All of these factors can result in increased mortality rates and greater capital loss unless smallholder breed upgrading is also supported by enhanced access to veterinary care and adequate feeding regimes. This requires both technical skill and, potentially, capital investment that is beyond the abilities of most smallholder producers.

Other challenges include gaps in basic pig husbandry resulting in high rates of herd mortality, sub-optimal traditional feeding routines, and limited technical skills and access to veterinary services, and variable access to adequate genetics.

Access to reliable information about prices can improve smallholder strategies to some degree, but the structural issues related to development of more advanced marketing systems will require smallholders grow in scale and competency in order to participate in these marketing chains. While growth in the scale and level of competency of small pig producers is intimately related to their continued participation in these markets, (whether through growth in small commercial production, supply aggregation through group marketing or contract farming), their prospects are

also significantly dependent on other features of their operating environment that must be approached through a qualitative analysis.

3. Analyzing Competitiveness

Commercial pig production worldwide is governed by a single “input-output” equation: how many kilograms of lean meat and other pork products can be produced by a given amount of feed, and at what cost. The main performance indicators for pig fattening relate to the speed and efficiency of conversion of feed to meat, the survival of pigs until they are ready to be sold, and the final result of the product—either a piglet ready to be fattened or a market-weight slaughter hog. In this “production frame,” risks to smallholders mainly come from animal diseases that kill pigs before they can be sold as meat or decrease the productivity of the herd of animals in producing offspring, and therefore, in producing meat for sale.

Yet, for Asian smallholder producers facing the challenges of rapidly evolving environments, production-focused approaches to the competitiveness of the swine raising enterprise are *necessary but not sufficient* to generate actionable policies or programs to support smallholder participation and upgrading. The challenges to Asian smallholders outlined in the previous section begin, but do not end, with production-related issues. They also encompass market mediation issues related to value chain governance, including the organization of production by lead firms, the introduction of product standards requiring traceability and control over the value chain, the requirements of scale for participation, as well as trade and disease impacts.

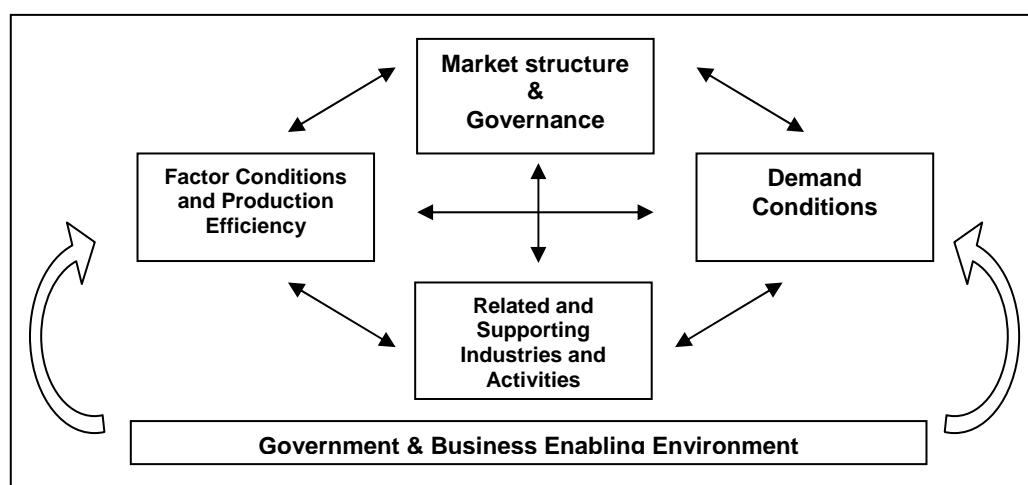
Smallholders also must draw upon related and supporting products and activities to comply with requirements of new market governance arrangements, whether they are imposed by buyers or contracting firms. As a result, the presence of and access to related and supporting products and activities—for example, veterinary services for larger herds and improved breeds, high-quality medicine and vaccines, and new information about risk-minimizing production processes—become important concerns sustaining and upgrading smallholder enterprises. These are traded (and sometimes non-traded) externalities, as opposed to initial endowments of factor the factors of production.

As a result, a broader analysis of the competitive environment in which smallholders operate is necessary to determine their prospects for sustainability and upgrading. One appropriate model for exploring these broader issues is the *Diamond of National Competitiveness* developed by Professor Michael Porter of Harvard Business School.

The *Diamond model* is currently the most widely used and best understood tool in analysis of the competitiveness of industry systems that are defined by a specific geography.⁸ It considers the interaction of five sets of conditions as the determinants of the competitiveness of regional production systems: (1) conditions and utilization of the factors of production; (2) demand conditions; (3) market structure; (4) related and supporting industries and activities; and (5) government and business enabling environment.

⁸ M. Porter, *Competitive Advantage of Nations*, Harvard Business School: Cambridge. 1990.

Figure 1: The Porter “Diamond” Model of Competitive Advantage (adapted)



A territory does not necessarily need a perfect balance or mix of advantages in these areas to sustain a viable industry. Rather, the interaction of these conditions shapes and constrains overall performance of the regional production system. Advantages or strongly positive conditions revealed in this analysis can serve as the basis for smallholder competitiveness, while disadvantages—of which there are likely to be many—can be addressed based on how significant a role they play in limiting the territory’s upgrading prospects. Many issues will appear to be neutral—neither conferring advantage nor disadvantage on the smallholder system in light of the totality of observed conditions. What is important and useful in this analysis is revealing what is especially favorable and especially unfavorable in the territory under analysis.

One important premise of this model that should be highlighted is its assumption, based on Porter’s foundational work on Competitive Advantage⁹, that successful economic sectors tend to generate higher value by moving from competition based on “factor advantages” (derived from the factors of production) to new sources of competitive advantage based on more sophisticated interactions between the factors of production and the context in which they are utilized. In light of the relative importance of non-production related issues to the upgrading of the smallholder enterprise, this model offers promise in looking at smallholder performance and upgrading in light of the totality of their national or local operating environment.

4. Comparing Swine Competitiveness in the Mekong Subregion

In order to examine the issues facing producers in the region, an extensive benchmarking of three countries—Cambodia, Thailand, and Vietnam was undertaken under and FAO co-funded project.¹⁰ The focus of this study was on identifying key opportunities and constraints for the highly trade-impacted Cambodian smallholder sector, particularly in light of its less developed industry structure relative to its regional neighbors. The benchmarking activity began with a comparison of basic quantitative indicators of industry development and trajectory, focused on smallholder participation, followed by an extensive qualitative benchmarking of the factors related to overall sector competitiveness using the framework of the *Diamond* model. The study set out to benchmark the cost and operational measures of the three national industries to determine the position of each country relative to regional trading partners, to highlight the role of smallholders, and to identify prospects for sustainability and success.

⁹ Porter, M.E., *Competitive Advantage: Creating and Sustaining Superior Performance*, Free Press, 1998, (1985).

¹⁰ *Swine Marketing in Cambodia (FAORAP-USAID)*, February 2008.

4.1 Comparison of Industry Composition

Quantitative indicators of industry composition revealed the Thai, Vietnamese, and Cambodian swine industries differ significantly, both in terms of historical development and present market conditions. Data from the FAOStat database and secondary research on the three industries revealed differences in the composition of production, productivity, intensity, and the importance of swine production and processing to the agribusiness sectors as a whole. Table 2 presents findings on the comparative productivity, intensity and trade profile of the three countries.

Overall, the swine sector is much more important to Vietnam's agriculture sector than to the Cambodian or Thai, reflected by higher production per agricultural workforce and higher meat yields per hectare of land under production. Both Thailand and Vietnam are historically net exporters of pork, albeit on a small scale. However, the higher proportion of Thailand's processed pig meat exports reflect a more advanced value added processing sector, despite swine's lesser important to the country's overall agricultural profile than poultry.

Table 1: Comparative Industry Capacity and Intensity

	Year	Unit	Cambodia	Thailand	Vietnam
Domestic Consumption					
Per capita pork consumption	2005	g/capita/day	26	29	68
Total pig product consumption	2005	1000 Tonnes	130	671	2118
Herd					
Producing Animals (Pigs)	2006	head	2715000	10755184	36000000
Pig Stocks	2006	Head	2740745	-	26855300
Production					
Production Quantity	2005	1000 Tonnes	127	687	2288
Production Quantity	2004	1000 Tonnes	123	680	2012
Intensity of Production					
Total economically active population in agriculture	2004	1000 persons	5001	20185	28936
Meat yield/ag workforce	2004	tonnes/person	0.024	0.034	0.070
Pig Meat Yield	2006	Y/ha	46	65	67
Exports					
Export Value of Pig Meat	2005	\$US x 1000	0	26236	27513
Export Value of Raw/Processed Pig Meat	2005	\$US x 1000	0	47322	28390
Imports					
Avg. Unit Value of Primary Commodity Imports	2005	\$US/Tonne	0	763	1350
Import Value of Primary Commodity	2005	\$US1000	0	559	207
Import Value	2005	\$US1000	2601	781	1077
Import Value of Raw & Processed	2005	\$US1000	323	3304	25052
Producer Prices					
Per Tonne	2005	\$US/Tonne	1830	1737	-
Per KG	2005	\$US/Kg	\$1.83	\$1.74	-

*Official reports: excludes unregulated imports Source: FAOStat Database.

4.2 Comparison on Sector Composition, Cost, and Performance

Table 2 presents a benchmarking of key cost and performance measures related to the smallholder enterprise. International benchmarking was undertaken to highlight the competitive position of smallholders relative to both larger production systems and to international peers. It reveals, to some degree, relative positions of the three countries with respect to factor costs, producer scale and competence, sector composition, and product differentiation between traditional and improved breeds.

Benchmarking cost and operational conditions is complicated by the key differences in industry structure discovered through this research. One conclusion of this study was that the three national industries have different enough operating structures to make many types of aggregate comparisons misleading. Some factors, including manufactured feed costs, can be analyzed in a relatively straightforward manner. However, the prevalence of on-farm feed mixing combining in larger producer segments makes this less illustrative of large producers' cost structures. Others, including feed conversion ratios, daily live weight (LWT) gains, and other factors are either unavailable from large producers or derived from unreliable or non-comparable sources. Overall comparisons would also necessarily average the most and least advanced sub-sectors of three industries at vastly different stages of development.

Understanding basic financial returns with respect to the analysis of the fixed costs of small commercial producers is also extremely difficult. Fixed (investment) costs may not be accounted for at all (as in Cambodia), may be less well-researched (as in Thailand), or may be moderately subsidized and therefore not comparable (as in Vietnam).

These data issues highlight the need for segmentation of the market to clearly identify the position, performance, scale, and competency of smallholders relative to the sector as a whole, and to compare their performance to relevant domestic and international market segments to depict their performance and prospects accurately, particularly where smallholders are competing with more advanced domestic and international production systems, and, potentially, with smaller commercial producers in regional neighbors.

Table 2: Composition, Cost, and Performance Comparisons

	Unit	Cambodia	Vietnam	Thailand
Industry Composition	2006			
Smallholder % output	%	90%	64%	≈10%
Small commercial % output	%	3%	20%	≈15%
Medium commercial % output	%	3%	10%	≈25%
Large/Integrated % output	%	4%	6%	≈50%
Factor Costs				
Commercial Feed Costs (retail 2007)	\$US/kg	\$0.55	\$0.46	\$0.42 (rising)
Local gilt costs (2007)	\$US	≈\$35	n/a	n/a
Hybrid gilt costs (2007)	\$US	\$45-\$50	\$35-\$45	\$31
Production Measures				
Feed conversion ratio (FCR)-small producers*	Feed req. per kg LWT gain	≈6.5-8	≈6	≈6

Slaughter weight: small producers avg. kg	KG	≈65	≈81	≈90
FCR: large producers		≈2.6-3.0	≈2.6	≈2.6
Slaughter weight: large producers avg. kg		88-100	88-100	≈110
Output Prices				
FGP per kg LWT (present)	\$US	\$1.70-\$1.95	\$1.75-\$2.13	\$1.38
FGP LWT 2005	\$US	\$1.43	\$1.57	\$1.30
Retail price of pork meat (2005)	\$US/kg	\$2.93	\$2.50-\$3.00	\$2.51
Retail price of pork meat (current)	\$US/kg	\$4.25	\$3.5-\$4	\$2.85*
Price premium for high lean meat content/low back fat	%	24%	20-30%	>10%

4.3 Comparison of National Swine Industry Competitiveness Impacting Smallholders

Benchmarking the sources and conditions of the three countries' competitive advantage entailed a more in-depth research effort to draw comparisons among the meaningful factors of each industry's structure. Table 3 presents a summary of the results of an in-depth investigation of the overall market structure in the Diamond framework.

Table 3: Comparison of National Swine Competitiveness Conditions

	Cambodia	Vietnam	Thailand
<u>Demand Conditions</u>	Moderate domestic demand. Pork is third preferred protein source after fish and beef.	Strong and sophisticated domestic demand: Pork is preferred animal protein.	Moderate and stable: pork is second to chicken as preferred protein source. Beef consumption rising.
Per capita consumption	26 gram/person/day	68 gram/person/day	29 gram/person/day
Sophistication of Demand	Urban and tourism markets demand low-fat, village and province markets less demanding	Urban and tourism markets demand low-fat, village and province markets less demanding	Urban and tourism markets demand low-fat, village and province markets less demanding
<u>Sector Composition and Competitive Structure</u>	Smallholder dominant	Smallholder dominance declining, mid-commercial ascendant	Integrator-dominated with significant mid-large independent producers. Smallholder resilient
Sector Development	Early development of more advanced value chain set back by 2005, 2006 swine surges, market collapse. CP Thailand serves as lead firm. No domestic lead firms.	Rapid development of mid-size commercial and large producers until 2006 market collapse. Development driven by imported technologies and foreign firms. Multiple lead firms.	Integrated sector is mature, integrated around few large Thai lead firms, CP most importantly, followed by Betagro, <i>et al.</i>
Current market phase	Recovery/Growth	Threatened/Recovery	Stable/Differentiating
Linkages of large-small producers	Few linkages outside donor-driven relationships.	Few known linkages. Nascent contract farming.	Extensive linkages structured through contract farming system.
Domestic market function/efficiency	Majority of market limited by poor slaughterhouse conditions and prevalence of non-refrigerated hot markets.	Bifurcated market, with integrated producers performing well, provincial markets limited by poor slaughterhouse conditions and prevalence of non-refrigerated hot markets	Bifurcated market, with integrated producers performing well, provincial markets limited by poor slaughterhouse conditions and prevalence of non-refrigerated hot markets.
Barriers to entry and rents	Informal regulation and network membership limit wholesale and value added participation.	Few barriers to entry. Government encouraging market entry.	Advanced barriers around market chain, irregular government regulation for foreign entities.
Market development strategies	Limited to donor involvement.	Driven by cold chain and supermarket sector upgrading.	Driven by supermarket cold chain, integrated producer differentiation (brand) strategy and government abattoir upgrading.
International Market	None: Sanitary conditions and capacity limit access.	Limited and Growing: Export potential offset by sanitary standards.	Limited and irregular due to protectionism and FMD history.
Access to export markets	Cambodia does not meet SPS standards for exports to attractive international markets.	Vietnam preparing for SPS certification; various bilateral agreements.	History of FMD and domestic market protection have led to retaliatory limits on Thai access to markets.

Table 3: Comparison of National Swine Competitiveness Conditions (Cont.)

	Cambodia	Vietnam	Thailand
Factor Conditions	Poor with moderate potential.	Strong and improving with key limits.	Strong but dependent on imports for feed inputs.
Feed	Net exporter of key feed inputs- corn and soy. Poor domestic processing capacity. No research base	Strong and growing. Large research base.	Strong but dependent on energy imports.
Breed	Low quality breeds predominate due to resilience, feed costs.	Advanced breed capacity still short of market demand.	Advanced breed capacity: exporter of breeds.
Veterinary services and medicines	Poor. Consistent quality problems with services and products.	Segmented. Advanced infrastructure with significant gaps in FMD control.	Advanced infrastructure and high product standards.
Credit-Finance	Informal credit. Limited bank and MFI interest.	Wide array of government-supported C&F options for upgrading for commercial and smallholders.	Developed credit market focused on commercial sector and engaged in upgrading.
Human Capacity	Poor	Varied	Varied
Technical	Technical capacity across value chain is low, with the exception of new commercial entrants and a few breeders. Abattoir capacity very low.	Varied technical capacity. Smallholders remain low-medium capacity despite extension efforts. Growing commercial/industrial market with world-class technical capacity.	Integrated (majority) of market has sophisticated technical capacity. Contract producers supported by large firms. Independent abattoir sector technical capacity very low.
Managerial	Low: Most foreign presence is sales office only. Recently announced joint ventures may improve.	Varied: Low to high, international firms bring high managerial capacity.	Varied: High in integrated sector. Medium-high in independent commercial sector.
Entrepreneurial	Historically low. Breed sector has some entrepreneurs. Lacks catalyst.	High entrepreneurial energy based on sector growth and diversification. Much is foreign-based.	Entrepreneurial energy concentrated integrated operations and large independent producers. Banks catalyzing upgrading activities.
Social capital and external economies	Low with significant exceptions where informal credit provided. Producer associations developing.	Unknown	Formalized in producer associations.
Related and Supporting Industries	Shallow	Rapid development of services, primarily by foreign companies	Mostly internal to large integrators. Finance sector engaged in upgrading
Business Enabling Environment	Underdeveloped and corrupt: Weak capacity for enforcement of framework due to decentralization and fragmentation of authority.	Developmentally-driven: Moderate to high capacity. Regulation favors large, foreign firm development.	Strong/Permissive: Well organized producer sector aligned with government.
National	Highly non-transparent. Conflicting motives in national regulatory framework.	Government applies regulations evenly and competently. Limited public information about activities.	High capacity for monitoring and regulation frequently circumvented for lead firm advantage.
Provincial/Local	Arbitrary and frequently out of compliance with national framework.	Provincial regulation and development initiatives aligned with national policy.	No information

Table 3: Comparison of National Swine Competitiveness Conditions (Cont.)

	Cambodia	Vietnam	Thailand
Informal Regulatory Environment	Highly non-transparent	Moderately non-transparent, secretive, as competitive industry development strategy. Investor friendly.	Formally non-transparent as NTB industry protection strategy
National	Very poor/inconsistent	Positive/Competitive	Transparent to domestic sector.
Provincial/Local	Very poor/inconsistent	Positive/Competitive	Unknown
Private Sector Governance	Weak/Nascent	Unknown	Strong
Associations	Producer associations developing in response to industry needs and opportunities. High potential for industry organization if correctly implemented.	Unknown	“Pig Board” represents all interests in the industry. Multiple sector associations including producers, feed industry, and abattoir.
Formal Sector Support	Nascent	Development-driven sector with significant breed subsidization.	Developed support infrastructure.
Domestic Sector (National)	Government lacks coherent strategy or resources to implement existing strategic plan (2000). Ad hoc support.	Under a national agriculture development plan approved by the government in 2005, Vietnam aims to increase its pig herd from 27 million pigs in 2005 to 35-40 million pigs by 2010.	Industry supported through research, government-funded extension, and high level coordination. Key 2005 government initiative is abattoir upgrading.
Subsidy support	None. High unofficial import barriers act as non-tariff barrier.	High subsidization, estimated at \$100-200/sow/year provided to support breed improvement and producer growth.	Subsidization through market protection, Non-Tariff barriers preventing imports.
Inward Investment Promotion	Complicated by informal regulation.	Key goal is technology acquisition and modernization of livestock production through foreign investment supported through key policies.	Inward investment discouraged as domestic industry protection strategy.
Provincial	None identified.	Developed province-level support strategies implemented as pro-competitive industry development strategy.	None identified.
Donor/NGO	Numerous donor programs. Frequently uncoordinated and misaligned with market incentives and direction. Programs implemented along market principles more successful.	Numerous donor programs since 1990. Some important successes in breed and feed improvement are significant. Market-driven programs succeed due to high entrepreneurial motivation in Vietnam.	Industry is developed beyond need for donor support. Organized integrators act as key disseminator of technical support.

The foregoing comparison based on the Porter Diamond of Competitiveness, reveals for Cambodia a set of critical issues that offer a roadmap for addressing both strengths and weaknesses in the operating environment for smallholders. These findings are summarized in Table 4.

Table 4: Competitiveness of the Cambodian Swine Value Chain: Summary

Factor conditions	Market Structure & Governance	Demand Conditions	Related and Supporting Industries and Activities
High swine mortality limits factor efficiency. Aggravated by poor breed and feed options and limited veterinary services, poor quality medicines. Feed costs higher than competitors despite Cambodia position as exporter feed inputs (corn, soy, and cassava). Very limited human capital base in small producer sector. Lack of formal credit options. Entrepreneurial potential among breeding sector and input supply. Growing among small producers due to rising prices and donor-supported initiatives.	Smallholder producers remain dominant, except where donor interventions support small commercial growth Local wholesalers and traders orchestrate key market channels. Little market infrastructure for advanced industry development, limited cold chain. Lead firm governance limited to wholesale-trader networks. No domestic lead firms.	Moderate domestic demand base. Urban markets becoming more sophisticated, demanding lean pork meat. Product substitution in rising price environment possible due to consumer preference for fish and beef.	Few producer services or value chain-related suppliers. Limited bank and MFI interest in producer segment. Producer associations in nascent stage. Business network development driven by local informal credit relationships and donor interventions.
Government & Business Enabling Environment (BEE)			
National business enabling environment inconsistent though improving with modernization of legislative framework. Poor resource base and limited capacity for enforcement of legal framework are key obstacles. Principal challenges to BEE are at provincial level, which are frequently non-compliant with national legislation and introduce significant informal regulatory obstacles and barriers to entry, impeding upgrading.			

While the unfavorable environmental conditions far outweigh the positive for Cambodia, the analysis was revealing of several key strengths to build upon, including strong comparative advantage in feed resources and entrepreneurial energy in the breeding sector. The announcement in late 2008 by a key Cambodian business entity of a major investment in the breed, feed production, and processing sector, in a sense, validates the use of such an “environmental competitiveness” approach. Furthermore, the approach was strengthened by comparative analysis, which revealed opportunities for action by both public and private actors to support industry upgrading, improve market governance, and create a viable space for smallholder participation.

It is noteworthy that a simple value chain analysis of the sector, which had been performed prior this broader, environmental analysis, had failed to highlight the opportunities related to the key strengths and dynamics of the Cambodian swine sector. While the value chain approach can be a powerful approach for understanding and predicting the distribution of value in a national industry and the likely governance structures, a clearer understanding of the industry’s competitive context may be warranted. As Altenburg notes, “While it is relatively easy to describe physical resource flows and different marketing channels, calculate the number of producers at different stages of production, and gather other general sector-wide information, such data tells us relatively little about what the best available upgrading options are, how gains and risks are being distributed, and which policies are likely to sustain competitiveness in the long-term.”

5. Two “Futures” for Smallholder Market Participation

Returning to the smallholders, the development of additional appropriate strategies to assist producers must be formulated in a way that accounts for the presence or absence of various types of support in the national industry environment, with special attention to the rational economic choices that govern their behavior. In addition, stakeholders must, in some sense, choose between two apparently mutually exclusive visions of the future (or pathways) for smallholders. These pathways relate to the degree of integration into the national and international markets that is envisioned for small producers.

5.1 Serving Village and Remote Markets

The first “future” is that smallholders will continue to serve as the main source of supply for village and remote provincial markets rather than focusing on participation in growing urban markets. In this scenario, smallholders continue to raise fewer than ten pigs per cycle as a livelihood strategy in a multi-objective farming system. This vision is not unlikely, though it carries some risks, since rapid urbanization and widening urban-rural income gap do not suggest a certain, nor a promising, future for village markets. In addition, the premiums received by producers for high LMY breeds are smaller in village markets controlled by local trading monopolies than in more demanding urban markets, suggesting that costs associated with breed upgrades may not be justified by higher FGP for finished pigs, at least in Cambodia.

Nonetheless, if smallholders are expected, in the future, to participate only in village-level pig meat markets (which are less demanding of lean pork meat and more accepting of traditional breeds), stakeholders should continue to emphasize reduced swine mortality among smallholders through technical assistance programs aimed at improving the husbandry skill of producers and their access to reliable veterinary services. This approach might best be viewed as a subsistence-focused, rather than a commercial, strategy.

5.2 Expanded Participation in National Swine Value Chains

Southeast Asia’s current swine industry development trajectory, changing consumer preferences favoring lean pork meat, and projected future growth trajectory of supermarkets and non-traditional outlets for meat products in urban areas, and international competition, will make the issues of smallholders’ production scale and product quality more significant. If stakeholders envision a future in which smallholder producers participate significantly in national swine value chains, and in particular, in the system of supply for rapidly growing urban markets, the smallholder must draw upon numerous aspects of the industry environment.

A better understanding of the economic opportunity of the smallholder producer reveals that upgrading must proceed in tandem with environmental changes that address the upgrading-related needs, most of which are off-farm issues.

5.3 Scenarios for Smallholder Upgrading

Table 5 presents a step-wise analysis of smallholder options for advancement and upgrading, laying out probable costs and simple financial returns¹¹ of six upgrading scenarios that are representative of Cambodian smallholders’ options to improve operational scale, product quality, or both. These options are based on reference prices collected in February-April 2008. This analysis suggests that smallholder preference for raising less expensive (traditional) high-fat breeds reflect economically rational risk-minimizing behavior in the context of limited technical

¹¹ This model is a simple profit margin calculation and does not attempt to assess the full economic costs of smallholder production. It therefore excludes imputed labor costs and land ownership or rental costs, or non-financial returns to production derived from on-farm use of manure or household waste-disposal. Fixed costs are limited to installations such as a pig pens/houses and fences, which are the first requirements for moving beyond ‘backyard scale’ production.

skill and a poor quality veterinary services and input base, as revealed in the foregoing benchmarking conclusion and widely-reported in the Cambodian livestock community.¹²

Scenario 1: Baseline smallholder model. This scenario illustrates that smallholder raising of traditional breeds is, based on these assumptions, marginally profitable, even with high mortality rates, as long as it requires no fixed capital investment in installations, low feed input costs, and no veterinary service or medicine inputs.

Scenario 2: Local breed growth through veterinary services and installation upgrades. This scenario illustrates expansion of smallholder operations using traditional breeds, and reflects a strategy of growth through moderate service utilization leading to marginally reduced mortality. The combination of added service input costs and fixed capital investment reduces profitability from 9% to 6% based on these assumptions, even without improvement in feed quality through enhanced use of high quality compound feeds. This scenario marginally reduces profitability of smallholder operations, even in the event of decreased mortality, since FGP of traditional breeds does not rise in tandem with the increased production costs that are incurred to decrease mortality rates.

Scenario 3: Traditional breed growth with services, installations and increased feed purchases. This scenario outlines financial results of one strategy to improve outcomes with traditional breeds. Simultaneously increased volumes of low quality compound feed and (market priced) service utilization along with capital investment in facilities result in negative returns for producers. With similar assumptions to Scenario 2, it assumes higher yields and drastically decreased mortality achieved by better feeding routines in combination with (market priced) service utilization and installation investment to permit larger-scale operations. Assuming market-priced service and medicine inputs, even significant gains in yield and swine survival result in small losses for producers.

¹² According to Pok Samkol, Khieu Borin and Sen Sovann, Pig System in Southeast Asia, Cambodia Case, Regional Workshop on Pig System in Asia and Pacific, November, 2006, slide 5, “Farmers keep animals in traditional scavenging systems as means of risk management rather than in systems more orientated toward increased production and incomes.”

Table 5

Producer Upgrading Scenarios

		Production Costs					Output Results			Revenue		Key Issues and Constraints
		Feed	Piglet	Med	Service Costs	Fixed Costs*	Pig Weight	Survival %	KG LWT Yield	FGP (riel)	Producer Margin	
1	Baseline Smallholder Scenario: Local pig breed traditional feeding with minimal compound feed use, no veterinary services or vaccination	\$35	\$30	\$-	\$-	0	65	65%	42	6850	9%	Sustainable: Traditional smallholder production yields small returns but minimizes risk through minimization of feeding costs, service inputs.
2	Smallholder "local breed" growth scenario 1 with no change in breed, marginal decrease in mortality through veterinary engagement and vaccination, and installation investments.	\$35	\$30	\$10	\$5	\$1.67	65	80%	52	6850	6%	Unsustainable: Investments in fixed assets, vet services undercut (eliminate) producer margins, even with decrease in mortality. Typical first step, which leads producers to revert to traditional, lower-investment model.
3	Smallholder "local breed" growth scenario 2 with no change in breed, large decrease in mortality through veterinary engagement and vaccination, increased volume of low-quality compound feed	\$51	\$30	\$10	\$5	\$1.67	65	92%	57	6850	-1%	Unsustainable: If small producer scales up production to cover fixed capital investments, margins quickly become negative, even with very high survival rates. Typical first step, which leads producers back to traditional model
4	Smallholder breed upgrade scenario with higher inputs of low-quality compound feed, no vet services or medicine inputs, no installation investments	\$51	\$40	\$-	\$-	0	78	65%	51	7500	6%	Unsustainable: Breed improvements alone without survival increases yields lower returns on higher capital outlay. Leads producers back to traditional model.
5	Smallholder breed upgrade scenario 2 with no investment in installations but improvement in mortality through veterinary service engagement and improved feed quality	\$60	\$40	\$10	\$6	0	88	92%	81	7500	28%	Correct first step: High-margin path requires simultaneous breed, feed, and medicine upgrade to ensure survival. Unsustainable: Without investment in installations, model has limited growth potential due to deteriorating pen conditions.
6	Baseline Small Commercial Production (MSME model): Hybrid pig breed, mixed compound and energy feed, veterinary services and vaccination, 15 pig capacity pens. \$60 total feeding costs	\$60	\$40	\$10	\$6	\$1.67	88	92%	81	7500	23%	Sustainable: Correct service mix permits profitable, constant return model including fixed capital allowance and incremental upgrading possibilities. Key factors are high yield breeds and high survival rate

Scenario 4: Breed upgrade without upgraded feeds or veterinary/medicine inputs.

This scenario reflects a smallholder's choice to introduce better breeds and a greater volume of low- to mid-quality feed without upgrading veterinary service and medicine inputs. A similar survival rate of 65% in this scenario reflects a "wash" between claims that better (hybrid) breeds have higher disease resistance, and counter-claims that producers are often unable to keep newly introduced breeds alive because of their unfamiliar disease patterns and producers' unfamiliarity with their special needs. In addition, hybrid- and exotic breeds generally require more rigorous feeding regimes and higher quality feeds. Again, this scenario is less favorable than the "baseline" traditional breed scenario, since declining mortality rates cannot be assured while production costs rise.

Scenario 5: Breed upgrade with appropriate feed and services. If producers can access appropriate breed, services, and medicines simultaneously, their margins can significantly increase. This scenario represents an optimal "first-step" for smallholders, yielding dramatically higher returns on capital investment and profit margins due to higher live weight gains and reduced mortality, as well as increased FGP from higher lean meat yields. However, the lack of capital investment in installations makes expansion beyond the backyard scale difficult or impossible.

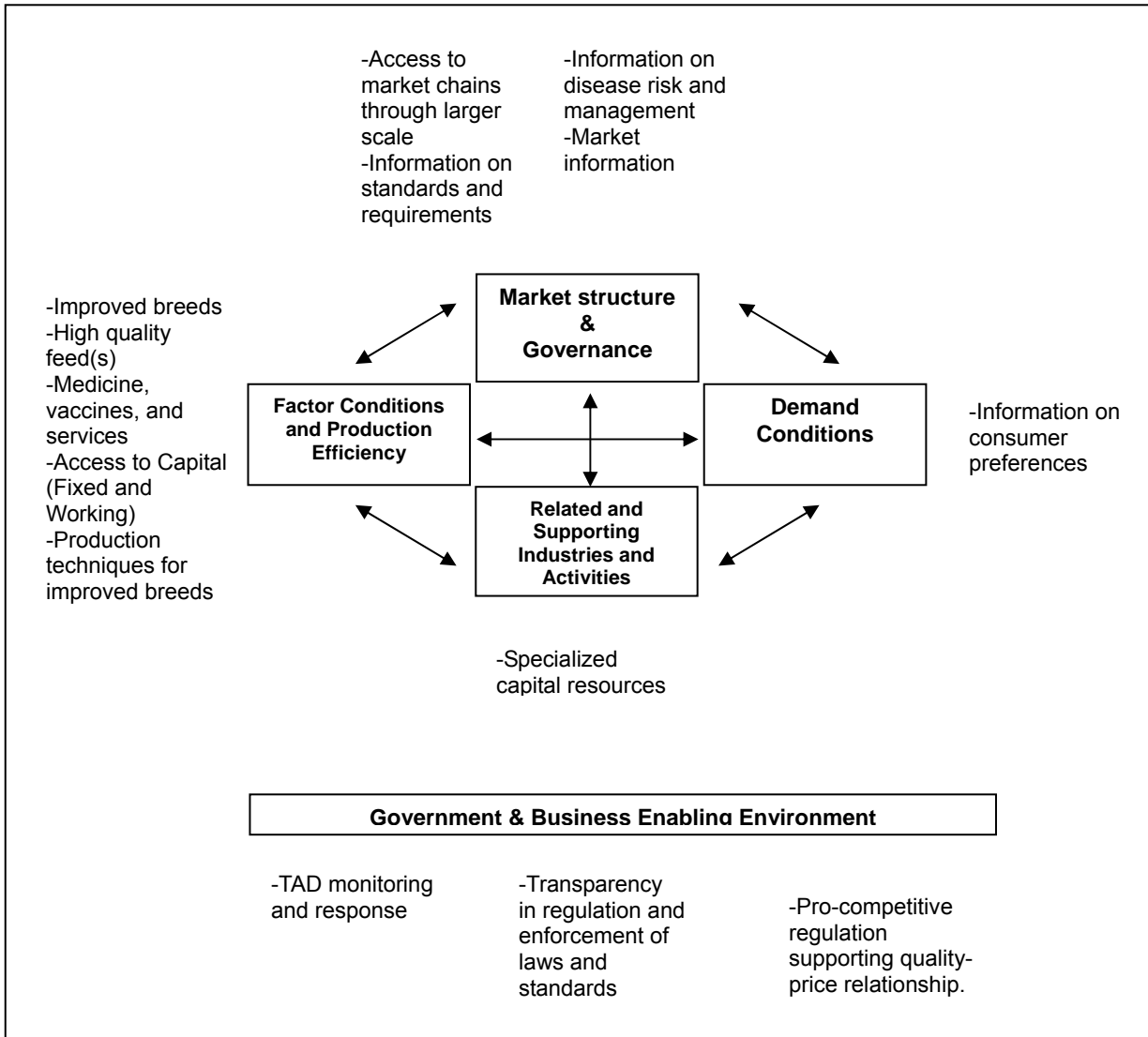
Scenario 6: Baseline small commercial production. Growth from smallholding to small commercial production using improved breeds with higher LMY and resulting FGP premiums (as in Scenario 5) also requires capital investment in facilities, slightly reducing the profitability of such an operation, but permitting expansion beyond the scope of backyard smallholder production. Both profitable and sustainable, this scenario supports smallholder upgrading from a subsistence to a commercial approach to swine raising, and would permit smallholders to participate more fully in the national market.

Based on this analysis, only scenarios 5 and 6, both of which depend on improved breed, feed, veterinary services, and on access to the national market chain for profitability, offer a clear pathway to improved smallholder performance.

5.4 Smallholder Upgrading Pathways and the Competitiveness Framework

The 'binding constraints' in scaling up such an appropriate model for smallholder transition to small commercial production might be seen, sequentially, as (1) market information regarding benefits of, and requirements for, breed and production system upgrading, (2) market access, linkages, and enhanced relationships with channel actors to realize these benefits through higher sale prices; (3) improved breeds and technical skill to maintain them; (4) appropriate feed resources; (5) appropriate veterinary products and services to support breed improvement; (6) enhanced availability of capital for facilities development and for the larger working capital requirements of feeding larger herds. To protect small commercial herd growth in the context of TAD risks, better information and private- and public-sector monitoring and response capacity is required. An analytical approach focused on breed, feed, and veterinary issues (and possibly capital issues) might ignore the first steps on the path.

Figure 2: Requirements for Sustainable Smallholder Upgrading- Diamond Model



6. Directions for Competitiveness in Smallholder Swine

If smallholder swine production can be best understood as a culturally-embedded economic behavior linked only to single-season (timely, current) price signals and tending towards pro-cyclical behavior (both over- and under-production), policymakers and donors should work to improve the operational scale, technical competency, and awareness of price information among smallholders.

Questions of how smallholders will relate to new governance structures of evolving value chains must be addressed through step-wise analysis of capacity and constraints on upgrading. It needs also to be recognized that commercial production at some scale may be the only financially viable option for *profitable* pig production in light of more stringent quality and delivery requirements of supermarkets and integrated producers.

6.1 Policy Challenges and Approaches

In less developed markets of Asia, one key challenge is to initiate national- and regional-level industry models in which the cyclical uncertainties of regionally-integrating markets produce outcomes that leave room in the market for producers of a variety of sizes (smallholder to integrated). Optimal outcomes will also support the development of entrepreneurial capacity in related and supporting activities such as feed and veterinary services, rather than favoring only integrated (multinational) producers with sufficient capital reserves to weather extreme cycles caused by gluts, overproduction, and TADs.

An important question in developing Asian countries relates to the programmatic vehicles that are best suited to address these technical constraints. One school of thought, favored by European donors, seeks to replicate advanced veterinary infrastructure along a public- or semi-public good model and to develop producer extension services to support upgrading. These activities clearly seek to improve conditions on the ground, but are criticized for lack of post-donor sustainability and also raise concerns due to their lack of market orientation.

Other vehicles, including the USAID-funded MSME program in Cambodia and a similar model in Vietnam advanced by VSF aims to facilitate market-based interactions between producers and private service providers, major input and veterinary goods suppliers, and financial institutions to facilitate the development of private-sector “embedded” services to the same end. These approaches are, in principal, designed to survive beyond their funding cycles, since the facilitation of new relationships among commercial actors along the value chain. Important questions about the quality of services provided by profit-motivated value chain operators have been raised in response to these models, and the sustainability of improvements in producer performance and growth remains to be seen. Furthermore, these models tend to target the most commercially viable/savvy smallholders and may lack applicability to the general smallholder population.

6.2 Issues/challenges facing Asian smallholder swine production and opportunities for follow-up

Demand-Side Issues

- 1) Emerging consumer preferences for lean pork meat accompanying urbanization and rising incomes.
- 2) Supermarket penetration and impact of cold chain

3) Slaughterhouse/abattoir upgrading and interaction with food safety and quality

Possible follow-up:

- Detailed case study on Betagro (Thailand) initiative to introduce branded products into traditional hot market environments;
- Further research on 2005 Thai initiative to improve provincial slaughterhouse/abattoir quality (status unknown).
- Research on smallholder participation in growing Vietnam supermarket meat distribution system.

Market Structure Issues

- 4) Lead firms and strategies in integrating swine production (contract farming, etc) and impacts on smallholders;
- 5) Capacity of small producers to respond to changing demand, and related strategic challenges in sector support and regulatory polic(ies). Strategies for “mainstreaming” smallholders.

Possible follow-up:

- Study of MSME and VSF Vietnam programs using non-distorting market facilitation strategies. Possibly comparative study addressing the two models. Patrice would be good candidate for this work, as he is familiar with the model.
- Philippines: San Miguel and lead firms role in producer education and upgrading

Industry Sustainability Issues (Health and Disease-Related)

- 6) Transboundary disease control issues, with reference to **SPS** and food safety standards, and the effect of TADs on market volatility.
- 7) Intensification-related risks to human and animal health¹³

Probable follow-up:

- Perhaps in concert with the above, a study on the AI-Swine market interaction in Vietnam and subsequent crowding/over-supply of market, aggravating FMD and PRRS transmission;

¹³ **Industrial Livestock Production and Global Health Risks**, J. Otte, D. Roland-Holst, D. Pfeiffer, R. Soares-Magalhaes, J. Rushton, J. Graham and E. Silbergeld, Pro-Poor Livestock Policy Initiative, A Living from Livestock Research Report, June 2007

Factor Conditions Issues:

- 8) Production cycle-based lending options and the need for alternatives to contract farming to provide risk mitigation for producers

Possible follow-up:

- Further investigation of Bangkok Bank's lending activities to support small-producer participation in national swine market
- Investigation of small- and micro-credit schemes supported by Vietnam's MARD and effectiveness of governance and delivery mechanisms.

Appendix 1: Recommendations for Follow-Up in Cambodia to Enhance Competitiveness of Local Industry

Issues and Recommendations

Producer Performance and Animal Health Issues	Possible Solutions
<ul style="list-style-type: none"> • High swine mortality rates and lack of producer technical skill for upgrading. • Limited producer access to veterinary and medical services. • Lack of resources for implementation of government animal disease control strategies. • Producer risk=input supplier risk due to input suppliers' role in providing credit 	<p>Use existing commercial networks: Expand outreach through local input suppliers to transfer skill and knowledge about vaccination to producers.</p>
	<p>Support local credit schemes for better disease control: Assist input suppliers in developing credit mechanisms that encourage and teach improved swine raising techniques by borrowers, focusing on vaccination and disease control.</p>
	<p>National-level embedded credit tools: Work with banks or MFIs and large input supply companies to develop embedded credit tools that encourage producer growth through vaccination and animal health risk reduction. Support these efforts with regional market monitoring capacity.</p>
	<p>Breeder education and outreach: Extension and outreach to breeders to encourage vaccination as a profitable product differentiation strategy.</p>
	<p>Relationship development for improved health services: Facilitate relationship development between input suppliers, wholesalers/traders, and VAHWs to encourage producers to engage animal health services.</p>

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Issues and Recommendations

Domestic Breed Supply and Unsafe Animal Trade	Possible Solutions
<ul style="list-style-type: none"> • Low swine product quality due to inferior breed availability. • Lack of access to adequate supplies of piglets and breeding stock. Informal piglet imports are low quality. • Risk of future import surges to meet market demand. • Conflicting incentives for enforcement of swine embargo and lack of RGC control over provincial officials. 	<p>Ensure high quality piglet supply through official policy: Work towards a participatory and transparent regulated import regime for breeding stock and piglets based on industry participation to ensure adequate supply through regulated channels.</p>
	<p>Locally-appropriate, survivable breeds: Enhance Cambodian swine breeds by learning from ACIAR-Vietnam breed and feed initiative (1995-2001) to develop high-yield, survivable breeds adapted to domestic feed resources.</p>
	<p>Continue bilateral and technical cooperation: Continue to support and strengthen MAFF quarantine and inspection capacity through technical support, and support bilateral agreement implementation.</p>

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Issues and Recommendations

Value Chain Upgrading and Competitiveness	Possible Solutions
<ul style="list-style-type: none"> • Opportunities for development of feed sector as source of sustainable competitive advantage. • Limited entrepreneurial capacity to support value chain upgrading. • Limited managerial capacity to support value chain upgrading. • Limited domestic participation of value chain investors. 	<p>Investor outreach: Work with MAFF-AMO to develop feed sector profile and information on market opportunities to support feed sector investment.</p>
	<p>SME and entrepreneurial development: Initiate agro-entrepreneurial development system to support and mentor sector entrepreneurial skills.</p>
	<p>Link investors to local needs: Convene livestock investor forum to develop better linkages between new investors and sector participants.</p>
	<p>Educate traders and stimulate futures markets: Trader education network to encourage better business practices and teach basic regulatory, and futures market experiment to develop interest in futures pricing.</p>
<ul style="list-style-type: none"> • Poor slaughterhouse capacity impedes value chain upgrading. 	<p>Long-term agricultural workforce development: Support improved agricultural workforce development through introduction of FFA-model non-curricular education in low-skill provinces.</p> <p>Use the profit motive to improve slaughterhouses: Initiate entrepreneurial development and upgrading program for Cambodia's slaughterhouse operators focused on developing branded products to promote improved conditions and performance and access to growing supermarket sector.</p>

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Issues and Recommendations

Regulatory and Business Environment Issues	Possible Solutions
<ul style="list-style-type: none"> • Destructive governance of the value chain through closed trading networks at the provincial level. • Provincial variation in regulatory costs for slaughter and trade activities. • Non-transparency in trader and abattoir licensing procedures. 	<p>Provincial associations: Implement provincial value chain advocacy strategy to help value chain participants organize associations and advocate for improved implementation of the regulatory framework.</p>
	<p>Improve SD 108 through Prakas: Work for improved clarity and predictability of new slaughterhouse licensing legislation (SD 108).</p>
	<p>Overhaul trader licensing: eliminate or substantially reconfigure trader licensing requirements.</p>
<ul style="list-style-type: none"> • Need for development-focused national framework legislation. 	<p>Framework legislation: Collaborate with industry in developing new framework legislation that promotes growth of national sector as well as international investment that contributes to the value chain's assets.</p>
<ul style="list-style-type: none"> • Discriminatory customs procedures for import of livestock industry inputs. 	<p>Camcontrol Reform: Support fundamental reform of Camcontrol as outlined in Gascoine, 2006.</p>
	<p>Simplify input import procedures: MAFF, Camcontrol, and CED should clarify and simplify procedures for input imports, to meet domestic feed sector needs. Drastically simplify JP 363/744 on management of veterinary medicine(s).</p>

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