RAPID VALUE CHAIN APPRAISAL OF MAIZE FOR PIG BREEDING IN LAI CHAU PROVINCE

Implemented by: Casrad team

Hanoi, 2010

TABLE OF CONTENT

1. Context **1**

2. Objective of the value chain study **4**

3. Methodology **4**

4. Research results **5**

4.1. Current state of maize production and livestock in Lai Chau 5

4.1.1. Current state of maize production 5

4.1.2. Current state of livestock raising 5

4.1.3. Current state of households. 6

4.2. Current state of maize and pig consumption 7

4.2.1. Current state of maize consumption 7

4.2.2. Current state of pork consumption in Lai Chau 7

4.3. The main form of raising pigs 8

4.4. Effect of maize production combined with pig raising analysis 9

4.4.1. The role of maize and pig for household income 9

4.4.2. Maize economic effect analysis 10

4.4.3. Effect of pig raising analysis 11

4.4.4. Maize demand analysis 12

4.4.5. The potential market for pigs 12

4.5. Difficulties and constraints 12

4.6. Some solutions 13

5. Conclusion **15**

1. Context

Maize is the second most important food crop in Vietnam, after rice, with increased production recently occurring in the North West Highlands to service the rapidly expanding animal feed industry. The rapid expansion of the maize sector is accompanied by poor land management practices making the industry unsustainable.

Maize production in Lai Chau plays important role in the province's agricultural production. Maize contributes not only to ensuring food security but also to the improvement of household income. However, maize production is still limited as traditional farming, using local maize results in low-yield of maize, maize growers' income / unit area is not high.

In recent years the livestock industry in Lai Chau has developed rapidly with pig production increasing significantly in quantity and value. Pork demand by local consumers is increasing and current supply cannot be met by demand. The development of pig production is different between districts in Lai Chau Province. For example in Ban Bo Commune - Tam Duong District pig production is well developed and also some areas near Lai Chau Town, while in most other districts, production is small and predominantly for self-sufficiency. In recent years, several disease epidemics have occurred for pigs and have caused great losses as the knowledge of famer and veterinary staffs are very limited so that the damage caused by the disease is great.

A market-driven and integrated approach to improved farm management will benefit the livelihoods of rural communities in the North West Highlands of Vietnam through the development and adoption by smallholders of more sustainable and profitable farming systems. Improved market linkages that are best suited to the agroecological conditions will be a strong driver for sustainable smallholder practice change. There are 2 main objectives of project (1) improve agricultural value chains competitiveness and (2) enhance production and soil management practice in smallholder maize and fruit based farming systems

From these reasons, we conducted research on “Rapid value chain appraisal of maize for pig breeding in Lai Chau province.

2. Objective of the value chain study

- To identify the current state of the maize value chain and pig value chain in Lai Chau
- To propose some solutions to improve the value chain of corn and pigs

3. Methodology

A rapid value chain appraisal was conducted for maize and pig production in two districts of Lai Chau. Surveys were conducted with 37 households – all of households must cultivate maize and raise pigs. For the household survey, the team focused mainly on Tam Duong District (30 households including 15 in Ban Bo and 15 in Giang Ma). Nine traders for maize were interviewed in Ban Bo and Tam Duong town and two slaughterhouse operators for pig were interviewed in Tam Duong. In Sin Ho, we asked one pork retailer (she was also slaughtering).

For maize market in Sin Ho, households who were interviewed did not mostly sell maize at all. Therefore, this report will focus on showing the maize consumption channels in Tam Duong district. However, because all famers in Sin Ho and Tam Duong sold pigs, the result of pork consumption will present for both districts.

4. Research results

4.1. Current state of maize production and livestock in Lai Chau

4.1.1. Current state of maize production

Table 1: Fluctuation of area, yield and quantity of maize in Lai Chau

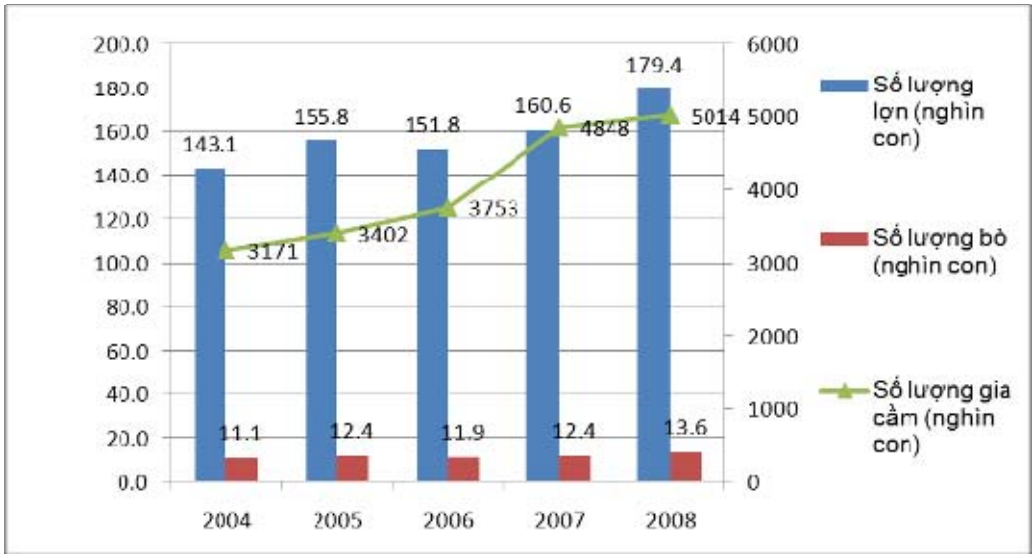
Item	2004	2005	2006	2007	2008
Area (thousand ha)	15.0	16.0	17.0	17.8	17.8
Yield (quintal/ha)	15.3	18.1	18.9	21.1	22.0
Quantity (thousand tons)	23.0	28.9	32.1	37.5	39.2

Source: General statistics office

In general, the total production area for maize production in Lai Chau has increased slightly over the past 5 years and reached nearly 18 thousand ha in 2008. While the policy of the province is to expand hybrid maize area and increase the yield gradually each year, in 2008 the yield is 22 quintal/ha, which is equal to 39,2 thousand tons.

4.1.2. Current state of livestock raising

Sơ đồ 1: Fluctuation of livestock in Lai Chau



Blue – No. Of pigs (1000s), Red – No. Of cattle, Green – No. of poultry
Sources: General statistics office

The number of pigs in Lai Chau from 2004 – 2008 increased significantly every year, except for a slight decrease in 2006 when numbers reached 151 thousand pigs. There was a peak at 180 thousand pigs in 2008.

4.1.3. Current state of households.

In the framework of the maize and pig value chain appraisal, we investigated the data in four communes in two districts, Sin Ho and Tam Duong, however because pig breeding is more developed in Tam Duong, we focused more our investigation and analysis in Tam Duong.

Table 2: Current state of households

Data	Ban Bo	Giang Ma	Sin Ho
Number of households	15	15	7
No of family members (people)	4.47	5.07	5.00
No of labours (people)	2.07	2.60	2.14
Distance to market (Km)	0.99	6.53	9.00
Distance to road (Km)	0.48	1.97	2.36
Area of rice (m2)	563	827	229
Area of maize (m2)	2,610	3,678	3,567
Total area (m2)	3,440	4,505	3,796
Average livestock scale (pig)	10 – 15 pigs	1 - 4 pigs	1 - 4 pigs

Source: Casrad 2009

The households, who have raised pigs according to a semi – industrial model were mostly located in Ban Bo commune with shorter distance to market compared to the traditional producers (1 $\pm$ 0.47 km from Ban Bo to the small market in this commue compared with nearly 7 $\pm$ 2.39 km of the distance between Giang Ma and Tam Duong Dat market (near Lai Chau Town)). Otherwise, the distance from their home to the main road is very near with 0.48 $\pm$ 0.3km, shorter than others. Therefore, this is an advatages for them to sell agricultural products to the market.

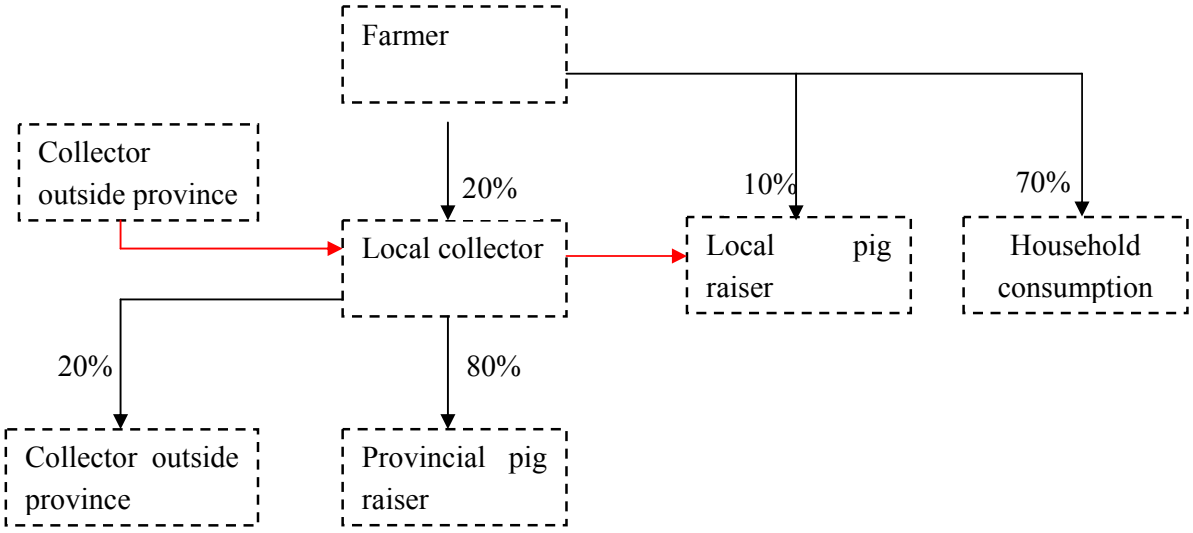
The production area, especially, maize production area in Ban Bo commune is smaller than others, while the demand of maize for pig raising there is so high. As a consequence, the famers have to buy maize for livestock.

In Ban Bo, famers raise pigs by semi – industry model used both industrial food and other food, so the average number of pigs per raising circle in this commune is about 10 – 15 pigs compared to 1-4 pigs in Giang Ma and Sin Ho.

4.2. Current state of maize and pig consumption

4.2.1. Current state of maize consumption

Map 1: Maize consumption channel in Tam Duong District, Lai Chau



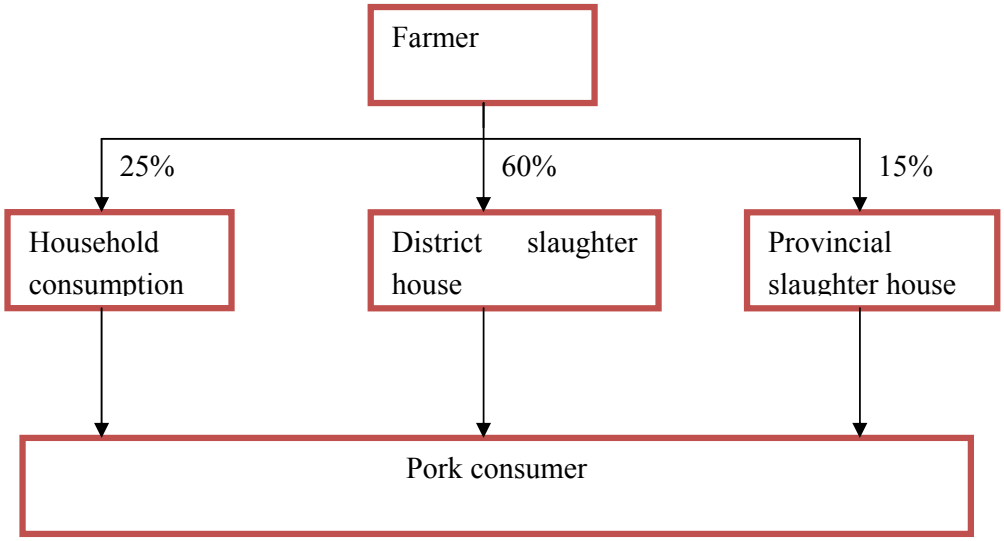
70% of the volume of maize is used for household consumption (i.e food for animals or humans). 30% of remaining maize is sold by 2 channels (local collector 20% and local pig raiser 10%). Almost all maize purchased by local collectors was sold to pig raisers in Lai Chau.

Therefore the value chain for maize in Tam Duong District is a short chain, mainly used for local pig raising while the demand for maize for livestock in Lai Chau is very high. It is clear that an opportunitiy exists to internverne in both the maize and pig value chain to make them work more effectively to support each other. At present there is only one maize crop produced per year however if this could be increased to two, there would a strong opportunity to supply feed directly to the pig production sector and this could potentailly reduce the costs of pig production associated with sourcing feed from outside of the province.

4.2.2. Current state of pork consumption in Lai Chau

The average annual amount of pork produced locally in Lai Chau Province is not sufficient to meet local consumption demand. In the central market of Lai Chau town, people still have to slaughter a large number of pigs imported from the provinces such as Phu Tho, Vinh Phuc to meet consumption demand (about 25% of the total annual consumption of meat in Lai Chau).

Map 2: Pork consumption channel in Lai Chau



Pig producers mainly sell directly to the slaughter house in the centrer of the district or communes. This accounts for 60% volume.

Due to the high demand for pork in Lai Chau town, some districts around the town such as Tam Duong also sold directly to a provincial slaughter in the town (15% of total volume). In addition, a large number of pigs (25%) are used for household consumption directly.

4.3. The main form of raising pigs

There are 2 forms of pig raising: semi – industrial and traditional.

Semi – industrial:

Location: mainly in center of distict or communes (e.g. Ban Bo commune – Tam Duong district).

Scale: Average size of farming households in the range from 10 to 15 pigs / raising cycle (with 2 – 3 raising cycles/ year). However there are also some larger scale producers with 50 to 100 pigs such as Ms Phin in Hung Phong commune - Tam Duong district.

Raising time: about 4 months per cycle.

Pig farming: mainly hybrid pig, some famers have their own piglets. However, most of them have to buy from neighbors or market.

Traditional rasing:

Scale: Average 1 – 4 pigs/raising cycle

Breeding time: one year/cycle or longer

Pig farming: local pig, almost of famers can produce piglets.

Breeding method: The pig is left unbridled, no pigsty, maize is the main food source although rice bran and vegetables may also be used to supplement feed. They do not use any industrial food at all.

4.4. Effect of maize production combined with pig raising analysis

4.4.1. The role of maize and pig for household income

Table 3: The contribution of maize and pig to household income

Unit: VND

Data	Bản Bo	Giang Ma	Sìn Hồ
Income from rice	1,733,333	2,258,333	2,053,571
Income from maize	**3,803,680**	**3,490,480**	**3,402,686**
Total income from cultvation	6,337,013	5,748,813	5,456,257
Income from pigs	**78,672,000**	**7,840,000**	**7,600,000**
Income from husbandry	79,697,000	8,490,000	8,162,500
Non-agricultural income	860,000	371,429	171,429
Total income	**86,894,013**	**14,610,242**	**13,790,186**

Source: Casrad 2009

As can be seen clearly from the table, income from husbandry plays an important part in total income of household. Money from pig raising is dominant in livestock, especially in Ban Bo while the income from cultivation is mainly based on maize production.

The income per household is fairly different between Ban Bo and other 3 communes in Tam Duong and Sin Ho districts (Lang Mo and Ta Ngao communes). The household's income in Ban Bo per year is higher than it in Giang Ma and Sin Ho. The numbers are about 87 ± 47 million, 15 ± 4 million and 14 ± 3 million respectively.

In general, the household's income in Giang Ma – Tam Duong, Lang Mo and Ta Ngao – Sin Ho is allocated from both crop and livestock. In contrast, the famer's income in Ban Bo highly depends on profit of pig raising.

4.4.2. Maize economic effect analysis

Table 4: Maize efficiency according to production scale

Unit: VND/1000m2

Data	**Bản Bo**	**Giang Ma**	**Sìn Hồ**
Seeds expense	65,663	48,484	41,530
Cost of nitrogen	89,785	73,608	59,086
Cost of NPK	158,382	122,460	114,118
Total expense	313,830	244,552	214,734
Income from maize	1,469,867	948,533	958,857
Profit	1,156,036	703,981	744,124

Source: Casrad 2009

It is clear that maize production is more effective in Ban Bo than Giang Ma and Sin Ho. Because of high investment in seed, especially hybrid seed and fertilizer, the yield of maize in Ban Bo higher than that in remainings. Consequently, more profit famers in Ban Bo obtain.

In Giang Ma and Sin Ho, there is not many household buying new seed for next season in stead of growing old seed from previous crop and using fertilize. So the expense for maize is low, it is 244.000 VND for the fomer and 214.000 VND for the later. This leads to lower profit from maize in Giang Ma and Sin Ho, approximately 2/3 value in comparision with the number in Ban Bo.

4.4.3. Effect of pig raising analysis

Table 5: The economic effect of 100 kg pig.

Data	Semi – industrial raising		Traditional raising	
	Qt (VND)	Ratio (%)	Qt (VND)	Ratio (%)
Piglet	506 667	31.34	299 429	10.22
Maize	**326 667**	**20.21**	**1 800 000**	**61.42**
Soybean residual	144 000	8.91	-	-
Rice bran	66 667	4.12	614 286	20.96
Industrial food	350 000	21.65	-	-
Veterinary	3 333	0.21	3 000	0.10
Labor	219 259	13.56	214 127	7.31
Total cost	1 616 593	100.00	2 930 841	100.00
Income	2 200 000		4 000 000	
Profit	583 407		1 069 159	

Source: Casrad 2009

Because of the difference in breeding time between semi-industrial and traditional producers (average 4 months for semi-industrial group and 12 months for traditional group) the cost of raising pigs is also very different.

For the traditional method, animal feed is mainly maize (61%) and rice bran (22%) but because of the longer breeding time, the total cost for 100 kg pig meat is nearly 3 million VND.

Meanwhile, the total cost for 100 kg pig meat for the semi – industrial method is only 1.6 million VND. The cost of industrial food and maize (more than 20%) accounted for most of the cost of pig feed (40%).

Because of the slow production of pigs under the traditional method and consumers perceptions of quality, the price for 1 kg pig in semi – industrial group is only 22.000 VND/kg compared with 40.000 VND/kg for traditional production. In terms of economic efficiency /100 kg of meat, the semi – industrial model is more effective than traditional.

4.4.4. Maize demand analysis

Table 6: Maize demand for pig raising/household

Data	Semi – industrial raising	Traditional raising	Average
Number of households	33.33%	66.67%	100%
Maize from production (kg)	951	873	912
Buying maize for pig (kg)	1 830	193	1 012
Own maize for pig (kg)	951	647	799
Maize for selling (kg)	-	226	242
Total volume of maize for pig (kg)	2 781	840	1 811

Source: Casrad 2009

For farmers operating the semi – industrial model of pig production, their own corn production only meets about 50% of the total demand for corn for livestock and therefore the remaining 50% must be bought from outside (mainly sourced from local collectors and other households).

For the traditional raising method, most producers are self-sufficient when it comes to corn for pig feed, however depending on the size of each household, excess maize may be sold or households may still have to buy in maize for animal feed.

4.4.5. The potential market for pigs

According to investigation results, current production of hybrid pig meat only meets about 70% of consumer demand for local pork. The main production areas that deliver the bulk of pork meat for the province are located in areas near towns and populated areas. The remaining 30% of pork meat is imported from other provinces such as Vinh Phuc.

For other types of local specialty pigs (black pig), many individuals and organizations want to buy local black pork but quantity is limited and the supply does not meet the demand.

4.5. Difficulties and constraints

*** For maize value chain**

Most households are growing only one maize crop per year (from April to August every year) – in both Tam Duong and Sin Ho. However, maize is grown 2 crops per year in Ban Bo commune (the second crop is from August-October, but the productivity is low)

Due to low demand for new seed, seed services provided by the private sector are often of unreliable quality and also contribute to low yield. In Sin Ho, many Mong people do not use any hybrid seed of maize for their crop.

Because the rate of using local maize varieties is very high and farmers do not follow advanced technical processes, productivity is very low. This is serious problem for famers in Lang Mo and Ta Ngao – Sin Ho.

Lack of knowledge of on post-harvest technology and preservation so maize is damage in short time with significant losses (up to 50%). In Ban Bo, some households have to sell maize immediately after harvesting because they cannot preserve maize for long time.

The main purpose of household maize production is often for household consumption, especially in Lang Mo and Ta Ngao – Sin Ho so even if they have some excess production, they do not wish to sell. The average volume sold by households is 10-50%. Due to a lack of excess product and lack of interest in selling maize (only sell when they need money), producers do not pay much attention to market prices and identifying the best time to sell.

- **For pig value chain**

For semi – industrial raising method

Lack of knowledge of pig breeding towards industrialization, poor knowledge of appropriate feed mixes according to stages of pig growth

Famers lack knowledge of animal health and particularly disease prevention for pigs. The quality of veterinary services at local levels are low, many diseases occur and cannot be controlled (e.g. green ear pig disease in Ban Bo - Tam Duong).

Low quality of industrial food in local region (some households reported having to send feed purchased from Thai Binh, Hung Yen in order to guarantee quality).

For traditional breeding

Pigs are raised on a small scale with no pigsty and many local pigs are easily affected by disease.

Vaccination rate for disease prevention is low, lack of knowledge of animal health and disease prevention and treatment for pigs so many pigs die from diseases (in 2009 - 40%)

Low number of qualified veterinarians in villages leads to difficulty in treatment and prevention.

4.6. Some solutions

Testing to grow 2-3 crops of maize/year to supply maize for semi-industrial pig production in some special locations such as in Hung Phong – Ban Bo – Tam Duong. The district extension station is currently trialing the potential for the production of 2-3crops/year and is interested in collaborating with the project.

Technical training for households in production, processing and storage of maize should be implemented to improve yield and reduce post-harvest damage in Tam Duong district.

The Government should regulate and stimulate the private sector to provide services such as seed, fertilizers and pesticides where the quality of the input materials can be guaranteed.

Provide technical training to households on how to mix the food for each growth stage of pig production in order to limit the purchase and use of industrial food
Training on disease identification and prevention for farmers to limit the risks associated with pig production.

Provide training to local veterinary staff to increase their knowledge and capacity to support households.

5. Conclusion

The rate of maize currently sold into the market by households in Tam Duong district is low (10-50%) and is mainly used for animal feed. The average maize production area per household is low and even in large areas only one maize crop is cultivated per year.

Pig breeding is very developed in some villages of the province, yet maize production in these households only meets 50% of the demand for feed therefore pig producers have to buy additional maize from local traders or other households.

Market consumption of pork products is strong with good potential for increased production as up to 30% of the pork sold in Lai Chau must be imported from other provinces. While pork demand is also forecasted to rise, with growth rates of pig production as they are at present, Lai Chau will not be able to meet the demands of local consumers.

While pig production is contributing significant income for farmers, livestock operations depend heavily on maize for feed yet the maize yield is low at present and is limited to one production season. Therefore, in future, it would better if we could coordinate activities to link maize production to expanding pig production in Lai Chau province and aim to increase the value added to both production supply chains.