



## Smallholders benefit from new market channel for pigs

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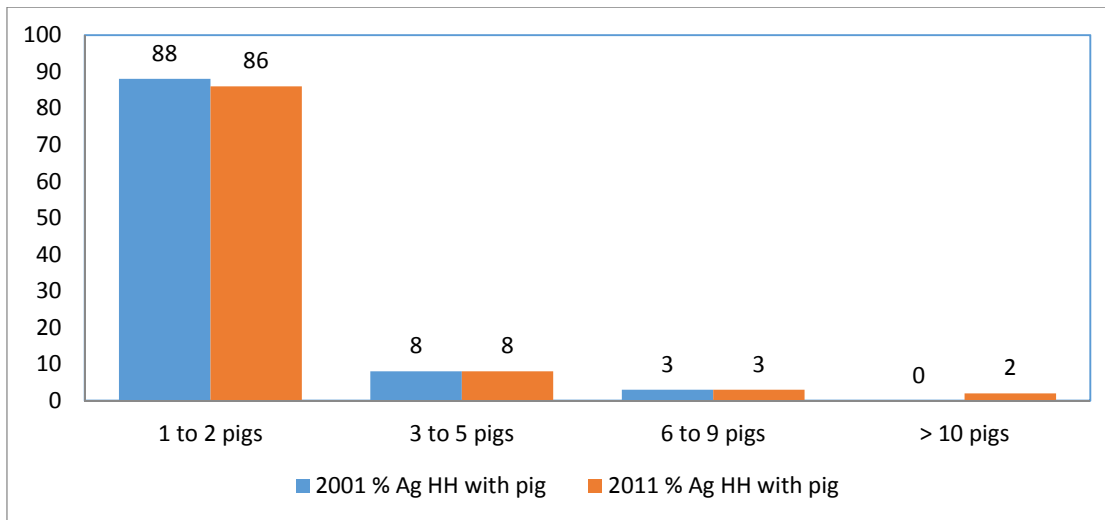
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## 1. Pig Market System: An overview

### 1.1. Introduction

Pig farming is a large sector in Nepal, which is practiced in simple, small-scale, and low-cost systems mostly in rural and remote areas. The poverty index of Nepal states that 35.1% of the total populations live below the poverty line and majority of them are from the marginalized and ethnic groups who practice pig farming<sup>1</sup>. The marginalized and ethnic groups comprising of Dalit, Adibasi/Janajatis represented by Rai, Limbu, Tharu, Magar, Damai, Kami and Sarki rear pigs through a very traditional and primitive form. In these ethnic communities, the women take the lead in pig farming and have a major say in using the profits earned from pig rearing. Most of these rural households fall below the poverty line and have no land or are smallholder farmers with less than 0.5 hectare (ha) land. Figure 1 shows the distribution of pig rearing household with respect to head size in percent.



**Figure 1: Trend of distribution of pig rearing HH with respect to pig herd size in Nepal<sup>2</sup>.**

Pig rearing has socio-religious obligations and brings additional income to the smallholder farmers. Production is typically low-input low-output with low productive breed (picture 1). Farmers usually feed pigs the by-products from the food industry such as kitchen waste and grain by-products, which the pigs convert into high value meat for consumption and sale. Thus, pig farming helps rural households to have a safety net in terms of savings, low risk investment, as well as source of cash for household expenditure. Pig rearing serves as a crucial source of livelihood in terms of savings, income and food for the people living below the poverty line.



**Picture 1: Traditional pig farming**

<sup>1</sup>2010/11 Nepal Living Standard Survey CBS, Thapali, Kathmandu

<sup>2</sup>2010/11 Nepal Living Standard Survey CBS, Thapali, Kathmandu

In the pig market, poor people are involved throughout the value chain. According to the Ministry of



**Picture 2: Pig farm developed by a returnee from abroad**

Agriculture Development (MoAD) and Ministry of Livestock Development (MoLD), mostly marginalised ethnic groups are involved in pig rearing across Nepal. About 49 percent of marginalised ethnic groups in Nepal farm pigs and eat pork and this number is steadily increasing<sup>3</sup>. The pig sector is expanding and the number of smallholder farmers rearing pigs has increased over the last ten years from 9.3 percent in Fiscal Year 2001 to 12.5 percent in Fiscal Year 2011,

making this sector even more of an attractive option for income generation amongst the disadvantaged communities. New entrepreneurs, especially migrant workers that have returned back to Nepal from abroad, have been establishing pig farms. With the increase in investments some small farms have grown into medium sized pig farms (Picture 2). However, there are various dysfunctions in the pig sector that is hindering scale, and benefits to the poor farmers and small entrepreneurs. A market analysis of the pig sector identified lack of linkages between the rural and urban markets as the main systemic constraint hampering the growth of the industry.

## 2. Dysfunction of Market System: Underperforming pig market due to limited access to supply

Pig farmers and urban markets were functioning independently. Pig farmers reared and consumed



**Picture 3: Import of pork for urban market**

pigs within their communities while the urban market sourced pork either from local commercial pig farms or abroad. The import of processed pork in urban areas (picture 3) constituted majority of total pork consumption in star hotels<sup>4</sup> as the pork supplied by local/commercial farms, through

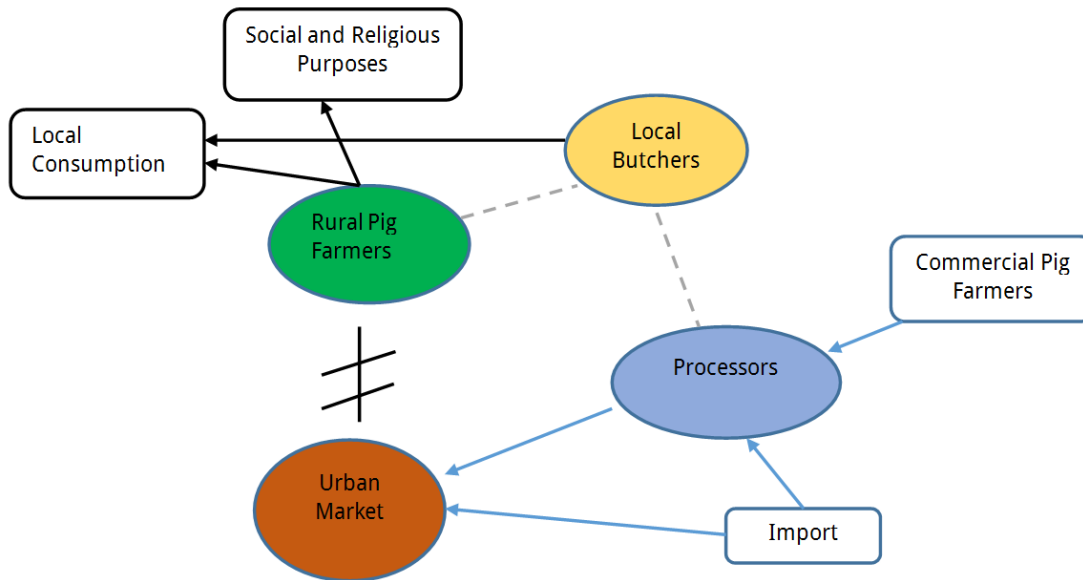


**Picture 4: Local sales of pork in rural market**

butchers, was of low volume and quality, which did not meet the market requirement. One of the main reasons for the gap between the national supply and demand is the lack of connection between pig farmers (rural) and urban markets (picture 4). It was necessary to link the pig farmers to the current supply chain to deliver and meet the urban market demand of pork. The market scenario of the pig sector is depicted in the figure below (figure 2):

<sup>3</sup>Lynn Bennett, December 12-15, 2005 Arusha Conference, "New Frontiers of Social Policy" –GENDER, CASTE AND ETHNIC EXCLUSION IN NEPAL: FOLLOWING THE POLICY PROCESS FROM ANALYSIS TO ACTION World Bank

<sup>4</sup>Sector Analysis and Vision, The Pig Sector, 2012



**Figure 2: Market scenario between rural farmers and urban market before the start of the project**

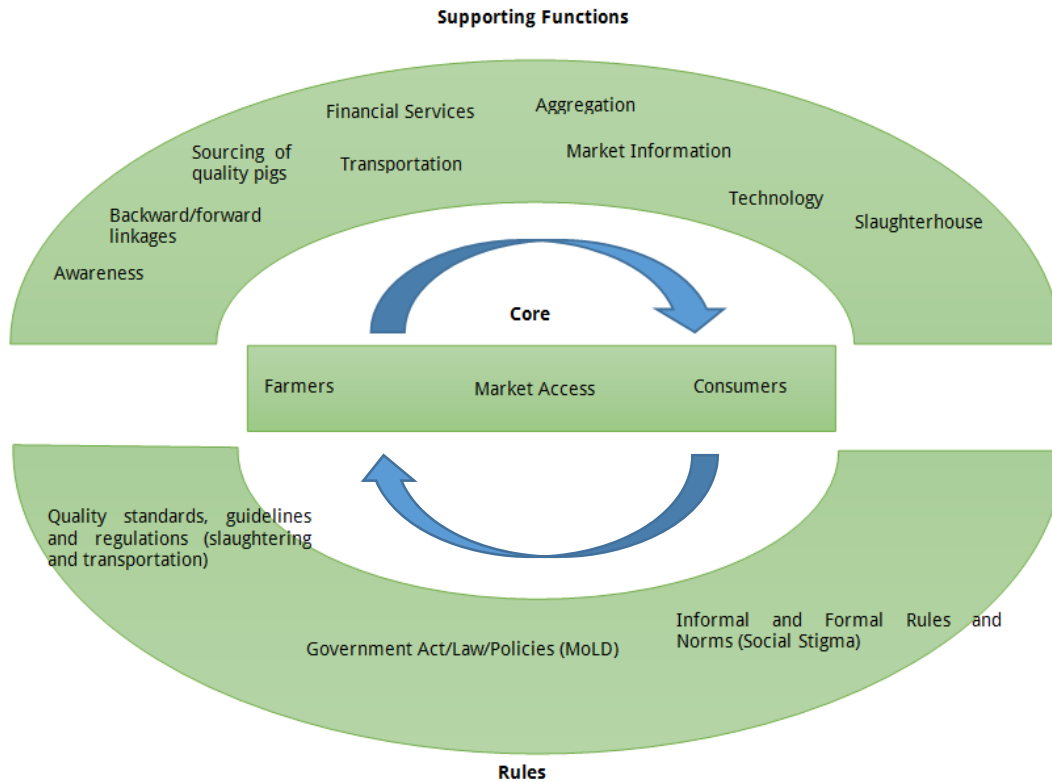
The figure above clearly shows that there was a limited linkage between rural pig farmers and urban markets where the access to market for rural farmers ended at the butchers' level. Butchers were the only link between rural pig farmers and urban markets, and could not supply large volumes to the processors as they did not have the slaughtering skills and cold storage capacity to trade in volume.

As processors could not get enough supply from rural markets, they had to explore other markets to meet their supply requirements. They imported pork to meet the urban demand and the demand of star hotels. The market analysis suggested that there were capable rural suppliers within country, but they were not engaged in the supply chain. The fragmented market made it difficult for the market players to access pork from internal rural markets. The constraint of the sector was large, but also offered a huge opportunity within market system to explore and strengthen the supply chain, where all the players including farmers could benefit from such a liaison. The processors wanted a steady supply of quality pork and the farmers wanted a guaranteed market so that they could rear more pigs. In order to identify the optimum intervention, the project conducted a detailed market system analysis with a focus on improving market access for the smallholder farmers which is detailed below.

### 2.1. Constraints Analysis

To analyse the pig market system we created a doughnut of the pig market system with the supporting functions on the top and rules and regulation impacting the system at the bottom (figure 3).





**Figure 3: Analysis of the pig market system**

The major supporting functions and rules that affected and strengthened the linkage between the rural farmers and urban market are detailed below:

**2.1.1. Supporting Functions:**

- a. **Sourcing of quality pigs:** Majority of pig farmers reared 1-2 pigs and followed traditional rearing system of backyard farming. They slaughtered pigs in their locality and sold some to the butchers. As the demand of pork in local markets did not require meeting quality standards or large volumes, the farmers did not have the incentive to increase their herd size and rear quality pigs.
- b. **Aggregation:** Aggregation is an important function for collecting pigs from the smallholder pig farmers and selling it to butchers. There were lots of middlemen/aggregators in the market, however they were scattered and had limited knowledge on market requirement. The old practice was that, the aggregators would source mature pigs or poor quality pigs from the rural smallholder farmers for less price and sell them at a higher price to the local butchers.
- c. **Slaughtering functions:** There was no pig slaughterhouse in Nepal and pigs were slaughtered in the primitive form (picture 5). The method of slaughtering pigs and lack of

quality standards along the onward chain through to consumers were poor, making it difficult to meet the quality demands of the growing quality conscious consumer market. The smallholder rural farmers sold their pigs in the local markets and had limited incentives to grow their pig rearing business as they did not have necessary skills, techniques and



**Picture 5: Primitive form of slaughtering pigs**

equipment to meet the procurement requirements of the urban market. A key constraint was lack of pig slaughterhouses in the country that would adhere to standards of hygiene and produce quality pork products in bulk to cater to the demand of the urban consumers.

### 2.1.2. Rules:

#### a. Quality Standards regulations for slaughtering and transportation

There were no standards, rules and regulations for slaughtering and transportation of pigs. Pigs were transported in passenger buses, tucked in luggage compartments. This primitive practice of pig handling and transportation not only increased the chances of mortality, but also made it difficult to transport pigs. Aggregators usually collected pigs in small quantities and transported it in pick-up trucks. Moreover, as there were no regulations for slaughtering and transporting pigs, people used to slaughter and transport pigs in the worst of conditions—making pork consumption undesirable amongst quality conscious urban consumers.

## 2.2. Market Players and their incentives in connecting rural pig farmers with urban markets

### 2.2.1. Aggregator

Aggregators are the middlemen who collect pigs and sell the pigs to butchers on a commission basis. However, they are unorganized and scattered in different villages and have limited knowledge on quality requirements of the urban market. The aggregators collected pigs from small holder farmers and bought whatever pig was available regardless of the quality. The market analysis revealed the fact that, if the aggregators were equipped with the knowledge on selection of good pigs and if the incentives such as commissions were structured around the quality of pigs they procured, they would start providing critical Good Husbandry Practices (GHP) information to the farmers to improve the quality of pigs. This practice would not only



fetch higher prices but also help the aggregators in penetrating quality conscious urban markets.

### 2.2.2. Butchers/Abattoirs:

Butchers are the most common traders of pork. They serve as a link between urban market and rural pig farmers. In general, there are two types of butchers—butchers that slaughter and sell pork directly to the consumers and butchers that collect carcasses from other butchers and sell the meat via retail outlets to consumers. However, both categories of butchers have limited capacity, and market presence. On average the butchers slaughter 1-2 pigs per day and do not maintain a cold storage facility. The capacity of butchers, in terms of skills and infrastructure, needed to be strengthened to expand their businesses and supply quality pork to urban markets

### 2.2.3. Slaughterhouses

In Nepal, several efforts were made to establish large-scale slaughterhouses; however, they were not commercially viable. In this context, it was necessary to establish appropriate, small scale slaughterhouses that were affordable to operate and manage by the rural entrepreneurs' and butchers. The main incentives for establishing small-scale slaughterhouses would be to increase local capacity to supply quality pork to meet the growing urban market demand for quality pork which was currently being met through expensive imports from abroad.

### 2.2.4. Processors

Processors are one of the major players in the pork market system. Processors add value to the pig carcass by processing it further into different pork products (picture 6). They focus on providing quality processed pork products to the consumers locally or export their goods to different markets outside Nepal. In Nepal, there are a limited number of processors and most of them are located in Kathmandu. They supply to urban institutional customers such as hotels, restaurants, department stores and other institutions. They are searching for quality meat to process as the demand for high quality pork is ever increasing. Presently, they are looking out for pig carcass in Nepal as it is relatively expensive to source it from other countries. Therefore, cost effectiveness and profit margins are the key drivers for the processors to connect with the rural pig farmers.



**Picture 6: Processors making pork sausages**

### 2.2.5. Consumers

Consumers of pork can be categorized into two broad categories: urban and rural consumers. Urban consumers mostly consume fresh prime cuts and processed meat in different forms such as sausage, ham and other frozen meat variants. Furthermore, Nepalese urban consumers prefer fresh meat with short food miles and quality. The second category of consumers (rural) prefers fresh meat and local variety of pigs, which have been reared in traditional ways and are not aware about product differentiation or quality.

## 3. Slaughterhouse intervention design and implementation

### 3.1. Intervention Design

The core function of pig and pork market is rural pig farmers as suppliers and urban consumers as the end market. Both the demand and the supply components of the pig market were functioning independently and had weak links with each other because of the following reasons:

- a. Farmers were not aware of the urban market demand.
- b. There was minimum market connectivity between rural and urban market segments.
- c. The role of butchers was limited to slaughtering and selling in local areas where they had to rely heavily on local aggregators who had limited knowledge on sourcing quality pigs.
- d. There was a thin linkage between butchers and processors.
- e. The processors were sourcing pigs mainly from the large commercial farmers and/or from other countries and did not opt to reach out to the rural farmers.

As the major market players of the pig sector were performing independently without any transactions between each other, it made the pig market system inefficient and costly.

Bearing the constraints in the market, it was necessary to bring all those players together to promote, catalyze and facilitate the pig and pork marketing system and improve the livelihood of pig farmers. To initiate the relation, it was necessary to first identify the gaps among each player and identify mechanisms to fill in the gaps and work towards a common goal of fulfilling each other's requirement where each market player should benefit from the relation in order to ensure scale and sustainability of the pig market system.

With this vision and plan, Samarth analyzed the entire system and had several discussions with the market players to identify the key areas where Samarth could intervene to have immediate and sustainable impact. Through thorough research, Samarth identified the core requirement of each party was a consistent production and supply of quality pork in bulk amount where farmers were guaranteed a secure market and processors a secure supply.

The major constrain for this was to identify and capacitate market players to act as a link between the urban processors and rural farmers. There were two potential market players who could step

up for this role—butchers upgrading into slaughterhouse and supplying frozen pork and aggregators upgrading to live pig transporters and supplying live pigs. With the right incentives, these two market players could supply pig/pork in bulk and get the attention of urban wholesalers and processors to work with them.

With this in mind, Samarth designed two major interventions:

- **Small and Micro Slaughterhouse** to upgrade the functions of butchers to link pig farmers and processors.
- **Live Pig Transportation** to upgrade the functions of aggregators to supply live pigs to the urban market.

## 3.2. Implementation

### 3.2.1. Small and Micro slaughterhouse

After the intervention design, an Expression of Interest was published to identify and select optimum partners for the establishment of a slaughterhouse. 13 applicants from 7 districts applied, out of which 6 of the applicants were shortlisted and their applications thoroughly evaluated. The evaluation criteria were mostly based on their willingness to expand and sustain new business models, capacity to invest, and willingness to reach out to the rural pig farmers and link them with processors and the urban market. After thorough evaluation, Chaudhary Bangur Pasal in Bardiya and Fresh Hygienic Food in Nepalgunj were selected. Once the companies were selected, several rounds of discussions were conducted with the applicants to make them understand their role and incentives in partnering with each other under this venture. It was clarified during the discussion that the partners should work to facilitate the linkage between pig farmers and urban consumers, and take up the role of aggregator.

Samarth offered to provide technical support to enhance their capacity, and provide knowledge and equipment to upgrade the butcher shop to a small slaughterhouse. The partnerships were signed and both the partners contributed land and building in the partnership, which amounted to 60% of the total partnership signed.

After signing the partnerships, the construction and refurbishment of the butcher shops were started. A consultant was hired to provide technical services to both the partners covering issues such as the slaughterhouse design, slaughterhouse equipment and development of commercially viable business plans. The equipment was designed, however, there were difficulties in identifying the right manufacturer to manufacture slaughterhouse equipment, as it was new to the market and had to be custom made. Samarth's pig team and the partners searched through the market and identified Sigma Refrigeration to develop the slaughterhouse equipment.

Sigma Refrigeration is a private equipment manufacturing company in Nepal. They specialize in dairy sector equipment such as chilling vat, refrigeration and other equipment. The company did not have any experience or exposure in manufacturing slaughterhouse equipment. After some convincing, Sigma was willing to take on the challenge of developing slaughterhouse equipment. The consultant, who designed the equipment for slaughterhouses, provided extensive knowledge in the course of developing equipment and its installation. Sigma installed equipment in both the slaughterhouses (picture 7) and provided technical support as well as after sales services.

Upon the completion of the slaughterhouse, a training was conducted to 17 butchers. The training touched upon skill development, operation and maintenance of slaughterhouse equipment, hygiene pork production, chilled and cold storage, transportation, linkage to urban markets, pig sourcing, pre and post-mortem and certification (picture 8).



**Picture 7: Butcher operating his small slaughterhouse**

After the training, the slaughterhouses strengthened their linkages with pig farmers. The slaughterhouses formed farmers' groups and requested the farmers to sell their pigs to the slaughterhouses. They also informed them that the pigs should be eight months old in order to capture premium meat and assured a stable and guaranteed market to the pig farmers. They introduced contract farming among the pig farmers and assured guaranteed sales. The objective of contract farming was to ensure benefits to both the parties and boost farmers' confidence to rear more pigs and enjoy economic benefits.



**Picture 8: Training to produce specialized cuts**

Contract farming was a new concept to the pig farmers and initially there were lots of hesitations in signing the contracts. The smallholder farmers were scared and felt insecure to sign off a contract paper without first observing its benefits and consequences. They were particularly afraid of consequences if they could not fulfill the contract requirements, as they never had done business through contracts. Several rounds of discussions were held between market players and farmers



**Picture 9: Discussion with farmers regarding contract farming**

(picture 9). Several clauses were redrafted to include flexibility in selling to other parties if the conditions were not met by one of the party, including transportation and price. After making all these changes to the contract, the farmers felt confident and signed the contract.

Thereafter, the slaughterhouses started sourcing quality pigs through contract farming. Farmers started increasing their herd size when they realized that there was a stable and guaranteed market demand for more pigs. The value of contract farming was further reiterated during the trade embargo and earthquake, when the demand of pigs went down and the national pig market crashed. Despite adverse external environment slaughterhouses kept their promises; they honored the contracts and continued buying the pigs when they were ready



**Picture 10: Storing pork in a cold room**

for slaughtering. They slaughtered the pigs and stored it in cold room when the market was down (picture 10).

On the supply end, with assurance on volume and quality, the slaughterhouses started venturing into new and urban markets. They looked into establishing strong linkages with the urban wholesalers and processors to maximize their profits. For this, Samarth-NMDP helped the slaughterhouses to identify the processors in major cities such as Pokhara and Kathmandu. After several rounds of discussions, Samarth-NMDP convinced the two processors (Meat Co and Urban Food) to visit the slaughterhouses in Banke and Bardiya. The main objective of the visit was to provide assurances to the processors on the quality, scale and scope of slaughterhouses.



**Picture 11: Transporting pork while maintaining a cold chain system**

The processors were also looking for quality meat from in-country slaughterhouses as it would reduce their operation cost of importing from other countries. With clear incentives for both the parties, the linkages were immediately established and the slaughterhouse started supplying quality pork to the processors via a cold chain maintained vehicle (picture 11).

### **3.2.2. Live Pig Transportation**

A similar Expression of Interest was published to identify and select optimum partners for the establishment of the live pig transportation system by upgrading a vehicle specifically for transporting pigs. After thorough screening of the applicants, Samarth partnered with Mr. Laxman Rai of Akriti Meat Shop to modify a vehicle and transport live pigs from rural to urban



areas. The partnership started with developing a collection center for collecting pigs and upon the completion of the collection center, the partnership would proceed with procuring and modifying a vehicle for transporting live pigs. In this partnership, the partner would procure the vehicle and Samarth-NMDP would support to upgrade and modify the chassis of the vehicle to transport pigs.

The partner established the collection center (picture 12) as per the agreement, but faced major issues while procuring a vehicle to upgrade and transport live pigs.



**Picture 12: Live pig collection center**

There were no set rules, regulations and standards for developing a vehicle to transport pigs which made the Government was hesitant to provide the permission to upgrade the vehicle and add double-decker cages to enable transportation of pigs.



**Picture 13: Endorsement of Standards**

Due to lack of live pig transportation design and regulation in the country, the partner was unable to procure a vehicle and we could not complete the intervention. However, this incidence made us realise the importance and the role of policies, rules and regulations in making the intervention successful. Building on the lessons, we supported Pig Entrepreneur Association Nepal (a BMO working for the development of the pig sector) to advocate for the establishment of necessary rules, regulations and standards regarding transportation of pigs and pork, and operation guidelines of slaughterhouse. Through tremendous effort and with Samarth - NMDP's support, the Government developed and endorsed the code of practice for slaughterhouse and frozen pork/pigs transportation (picture 13).

After the implementation of activities, there were significant shifts in behavior of the partners. Both partners recorded 100% business growth, and started slaughtering 5-6 pigs per day compared to 1-2 pigs per day, before the partnership with Samarth-NMDP. They have already sourced pigs from 2300 farmers and out of which, 39% of farmers confirmed increase in income.





Picture 14: Training material on GHP

After allowing this intervention to run for a year, we identified that if the slaughterhouse could provide embedded services like information on Good Husbandry Practices (GHP), technical assistance to the farmers and guide them to improve the quality of breed through hybridization, the smallholder pig farmers would at least double their revenue. Subsequently, we designed another intervention where we developed training material on Good Husbandry

Practices (picture 14) and capacitated the slaughterhouse operators to train farmers and provide them with embedded services (picture 15). We upgraded the business model where the slaughterhouse operators not only supply quality pork to processors, but gather information on quality production from the processors and transfer it to the farmers. The new business model is depicted below (figure 4):



Picture 2: Butcher providing GHP training to farmers

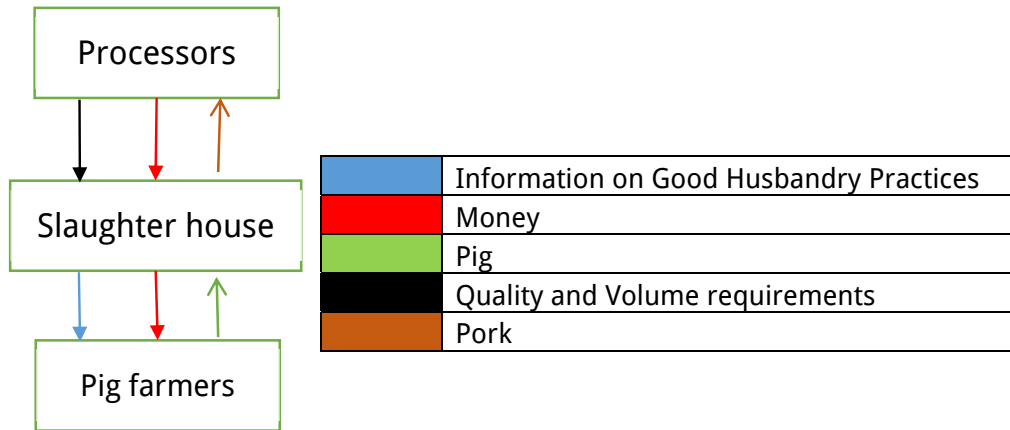


Figure 4: Business model with embedded services

In this new business model, there is more dependency and interconnection between the market players in the value chain which has triggered scale and sustainability in this project.

## 4. Establishing and opening new inter connected markets through pig slaughterhouse

When the partnership and business models were designed, there were very few premonitions for new and strengthened connectivity amongst the actors in the market through pig slaughterhouse. As the partnerships evolved, it opened new interconnected markets.

**Fresh Hygienic Food:** The partnership signed with Fresh Hygienic Meat was designed to establish linkages with the pig farmers and urban market. As a result of the partnership, the slaughterhouse was established and one round of training was conducted in Fresh Hygienic Food and Chaudhary Bangur Pasal. The partner established linkages with both the farmers and processors and started supplying pork. After the slaughterhouse was established, few butchers contacted Fresh Hygienic demanding trainings for butchers. The owner of the slaughterhouses started providing trainings to other butchers on slaughterhouse practice, good hygiene practices, operations about slaughterhouse etc. He charged Npr. 8,000 per training and has already provided trainings to 38 butchers. Several trainees have already upgraded their slaughterhouses, sourced pigs from farmers and linked with the urban market. Seizing the opportunity, Fresh Hygienic Food has diversified from his slaughterhouse practices and incorporated trainings into his business. He also realized that trainings boosted his activities and provided additional source of income. The trainings would benefit more butchers and help many more rural pig farmers to benefit from the formal value chain of pig sector.

**Sigma Refrigeration:** Sigma Refrigeration is an equipment manufacturing company. They mainly focused and specialized on producing equipment required for dairy and restaurant kitchens. When there was a need to manufacture slaughtering equipment, Samarth approached Sigma Refrigeration to develop equipment for slaughterhouses. Prior to the intervention, slaughtering equipment were never manufactured in Nepal and Sigma did not have the experience of developing and manufacturing such equipment. After several rounds of discussions, they agreed to manufacture equipment for two slaughterhouses. They built and installed equipment in both slaughterhouses successfully. After that another additional 5 butcher shops have already ordered equipment for slaughterhouses. Similarly, recognizing growth prospects, another company National Refrigeration has also started developing equipment for slaughterhouses.

## 5. Developing the market system: changes from interventions

After signing the partnership with two partners, trainings were provided on their capacity enhancement, operation, hygienic pork production, storage, prime cut, transport, link to bigger market, technology transfer, pre and post-mortem, certification, chilling process, and marketing. As a part of the partnership, a business plan of slaughterhouses was developed, highlighting indicators such as return on investment, break-even point, and business strategy. The two partners invested a total of NPR 27 lakhs on acquiring lands and building houses for slaughterhouses. Additionally, Samarth identified a consultant and a manufacturer to design and develop appropriate

slaughterhouse and equipment that were required for the slaughterhouses. Samarth facilitated linkages with the processors in Kathmandu and Pokhara. In one year of operation, the slaughterhouses expanded their market to 2,300 farmers through both formal and informal buying arrangements. They sold more than 199.9 MT of pork within the first year of operation to the processors in Kathmandu and Pokhara. The partners have signed buy back agreements with 780 pig farmers. Their business volume increased from slaughtering 1-2 pigs to 5-6 pigs per day with a twofold increase in monthly transaction.

After one year of operations, Fresh Hygienic Food established a network of butchers and provided trainings and capacity enhancement to ensure quality supply of pork. After the initial trainings, the demand for trainings increased. Fresh Hygienic Food started providing trainings to other butchers and incorporated training function as one of the business activities of Fresh Hygienic Food. They already provided trainings to 38 butchers on slaughterhouse practice. Out of total training participants, 80% have improved their butchering practices. They charged NPR 8,000 per training per participant. The partners started supplying to major markets in Kathmandu (2), Pokhara (1) and Butwal (1). Fresh Hygienic Food has now developed contracts with collection centres in 5 locations.

In order to advocate the importance of slaughterhouse to the Government, Samarth piloted the slaughterhouses with two partners and tested the business model. After reviewing the success in terms of business viability, establishment of market linkages by bringing small pig farmers to main stream market, the government also recognized the importance of slaughterhouse in making connections between urban and rural markets. In the meantime, Samarth prepared manuals on model slaughterhouses to enable wider scale adoption by other butchers and slaughterhouses. The Government acknowledged Samarth's effort and importance of the slaughterhouse in the pig value chain and introduced various government schemes for the establishment of slaughterhouses. Recognizing the importance of standard operating procedures and regulations in producing quality pork, DLS has endorsed code of practice for the operation of slaughterhouse and transportation of live pigs and frozen pork. The systemic market system changes of the pig sector are summarized in the table below:

<p><b>Adapt</b></p> <ul style="list-style-type: none"> <li>• One slaughterhouse has developed its network of pork suppliers by training and capacitating the small scale butchers and procuring pork</li> <li>• Partner slaughterhouses have expanded their supply to major markets in Kathmandu (2), Pokhara (1) Butwal (1).</li> <li>• One slaughter house has developed contracts with collection centers in 5 locations</li> <li>• Partner has conducted further trainings on the operation of slaughterhouses. A total of 38 individuals have received slaughterhouse training and more than 80% have improved their butchering practices.</li> </ul>	<p><b>Respond</b></p> <ul style="list-style-type: none"> <li>• The Government has developed code of practice for operation of slaughterhouse and transportation of live/frozen meat.</li> </ul>
<p><b>Adopt</b></p> <ul style="list-style-type: none"> <li>• In one year of operation the slaughter houses have expanded their market to 2300 farmers through both formal and informal buying arrangements</li> <li>• Two partnering slaughterhouses have extended their businesses and slaughtered 1040 pigs. They cumulatively sold more than 199.9 Metric Tonne of pork within the first year of operation</li> <li>• Two partnering slaughterhouses have signed buying agreements with 780 pig farmers</li> </ul>	<p><b>Expand</b></p> <ul style="list-style-type: none"> <li>• Two slaughterhouses are established in Pokhara and one in Kavre after the training on slaughter house operation</li> </ul>

Table 1: AAER Matrix

## 6. Lessons Learned and way forward

The major lesson learned from this project is that when intervening in a new market system, it is very vital to identify more than one strategy to diversify the risk and test which model works best. Since we had designed two interventions—small and micro slaughterhouse and live pig transportation to tackle the issue of connecting rural farmers with urban market, it was easier for us to gather the market response to various stimuli and fine tune the activities. As a result, we found out that it is very important and vital to have all the stakeholders including the government well informed and updated about the activities.

During the implementation of the project we faced a major issue regarding the rules and regulations for transportation of live pigs which hampered the completion of our intervention on live pig transportation. As there were no rules and regulations regarding the transportation of pigs, we could not complete the intervention and had to work on developing the standards for live pig transportation.

While we were working on the development of standards for live pig, we diversified into developing standards for other sections along the value chain and worked with the government and private sector to develop standards for slaughterhouse as well. If we had not met with this hurdle for live pig transportation, then we may not have worked on the standards for slaughterhouse, which would hamper the operation of the slaughterhouses in the future. Therefore, in weakly developed markets, it is very vital to have the government onboard in the implementation of the activities.

Another major lesson learned from this intervention is that we need to have versatility in the implementation of the market system approach project and may need to make changes along the way. During the beginning of the intervention, we anticipated that it was vital to have a contract between the farmers and the slaughterhouse, and this alone would be enough to increase the benefit of pig farming. However, along the way, we found out that more than contract farming, farmers were looking for information on improved pig farming and ways to increase the benefit obtained from pig farming. Through this lesson, we developed information on good husbandry practices and capacitated the slaughterhouse operators to effectively pass this information to smallholder farmers. We then incorporated this into the business model where the link between the processor and slaughterhouse is strengthened wherein the processor provides information on quality triggers and pork requirements to the slaughterhouse who then passes the information to the farmers; thus ensuring the sustainability of the relation between the farmers, slaughterhouse and processor. We further strengthened this link by developing a pork recipe book and trained chefs to trigger the increase of pork consumption; thus ensuring a steady pig market system from farm to fork.