

QUANG NGAI RURAL DEVELOPMENT  
PROGRAM (RUDEP) - PHASE 2

Cattle Finishing, Pig Raising and Chicken Raising  
Livestock Demonstration Review Report



**VIETNAM-AUSTRALIA**

*Prepared for*

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## Acronyms

ACIAR	Australian Centre for International Agricultural Research
AGIT	Activity Group Implemented Trial
CCG	Commune Contact Group
CPC	Commune People's Committee
DARD	Department of Agriculture and Rural Development
DDO	District Development Officer
DPC	District People's Committee
FCE	Feed Conversion Efficiency
HH	Household
HHs	Households
Kg	Kilogram
LWt	Liveweight
MEGO	Monitoring and Evaluation/Geographic Information System Officer
PAEC	Provincial Agricultural Extension Centre
PC/PA/PS	Problem Census – Problem Analysis – Problem Solving
PDA	Participatory Development Advisor
PMU	Program Management Unit
PPP	Participatory Planning Processes
QNRDP	Quang Ngai Rural Development Program
RUDEP	Quang Ngai Rural Development Program
TOR	Terms of Reference
VSCF	Village Credit and Savings Facilities
VND	Viet Nam Dong

## Summary

The Quang Ngai Rural Development Program (RUDEP) and the Quang Ngai Provincial Agricultural Extension Centre (PAEC) implemented 36 livestock demonstrations in 6 Program Communes from April – November 2003; 10 cattle finishing; 14 pig raising; and, 12 semi-scavenging chicken raising demonstrations. This Livestock Demonstration Review Report highlights the results of 3 separate evaluations: Final Technical Reports prepared by the PAEC (collected from field records); *Ad-Hoc* Evaluations of all 36 demonstrations (collected by the RUDEP MEGO and MEGO Assistant); and, The Final Review Workshop (involving all demonstration households, PAEC and RUDEP staff).

The results of the Final Technical Reports prepared by PAEC, the *Ad-Hoc* Evaluation Report and The Final Review Workshop revealed that:

- Cattle finishing is a profitable income generating activity. All demonstration households made a profit from one or both animals (an average of 324,000 VND per beast over a 64 day period). Households still face difficulties buying cattle suitable for finishing and selling finished cattle. The deeper transfer of marketing skills and information, including cattle scoring and weight estimation techniques, is recommended.
- Pig raising demonstrations were heavily affected by a sharp decline in pork prices. The reliance on feed concentrates, with little or no supplementary feeds fed to pigs, meant that growth rates were lower than projected. Reducing feed costs, and applying feed concentrates with supplementary feeds consisting largely of locally available products, is recommended.
- Semi-scavenging chicken raising demonstrations are a profitable income generating activity for poor households if local chicken varieties are raised and mortality levels are less than 10%. Vaccinations and disease control are effective in reducing overall chicken mortality levels. Improved care of chicks is required during their first month.
- Clear differences in extension approach exist between RUDEP and the PAEC. Pre-designed demonstration ‘models’ are the favoured avenue for the PAEC to transfer technical information to households. Consequently, households that participate in the demonstrations and training should have sufficient resources to adopt the technologies promoted. This approach to extension leads to implementing demonstration activities beyond the resource constraints of poor households and limits their involvement.
- Extension delivery and training methodologies are largely theoretical in approach leaving many households with difficulties in understanding demonstration technologies. This is particularly the case for ethnic minority households, women and people low education levels and low literacy/numeracy skills. Practical information transfer mechanisms need to be developed that are complemented with more visual training materials.
- The high cost of feeds, associated with the heavy promotion of expensive concentrates, reduces adoption levels with many households lacking sufficient funds to afford such an expense. Efforts to reduce feed costs in demonstration activities need to be trialled and promoted. This approach is being addressed with inputs from a National Livestock Feed consultant and RUDEP’s involvement in the ACIAR ‘Improved Beef Production Systems in Central Viet Nam’ Project.
- The approach of implementing pre-designed demonstration models means that households have limited involvement in demonstration design, implementation, monitoring or evaluation. Participatory techniques to involve households in the design

of demonstration activities are recommended and should be incorporated into all RUDEP demonstration activities. RUDEP's AGITs will facilitate the introduction and implementation of such an approach.

- Women play a critical role in household livestock production. Understanding the production roles of men and women is important and should be reflected in their attendance and participation in demonstrations and training events. RUDEP is initiating a Study on Gender Roles and Responsibilities in Program Communes. The results of this Study should be transferred to implementing agencies to ensure that women attend training events for production activities they are responsible for (and *vice-versa* for men).
- Many households lack the financial resources to adopt demonstration technologies. For many of these households, VSCFs remain the most viable and locally available source of credit. Increased adoption rates would occur if VSCFs established before, or shortly after, the completion of demonstration activities.

Major changes in extension approach and information delivery are needed to facilitate implementing activities appropriate for poor households. Key elements and concepts of 'participatory' and pro-poor extension methods need to be introduced. This will require the development of a comprehensive and systematic extension training program for Provincial and District Extension officers that covers topics ranging from basic extension methodologies to participatory extension approaches. Discussions between RUDEP, DARD and the PAEC have been initiated with the intention of a training program being developed and implemented in 2004 and 2005. Such a training program is being discussed with Hue Agricultural University.

# 1 Introduction

RUDEP is a 10-year poverty reduction and rural development initiative funded by the Australian and Vietnamese Governments that aims to generate income for poor households in Quang Ngai Province. Participatory planning processes (PPP) are a foundation for implementing RUDEP activities and involve the active participation of poor households. PC/PA/PS meetings conducted by RUDEP in six Program Communes<sup>1</sup> in March 2003 identified livestock, largely cattle, chickens and pigs, as the priority income generating activity of poor households.

Discussions eventuated between RUDEP and Provincial Agricultural Extension Centre (PAEC) on implementing livestock demonstrations in RUDEP Communes. Cattle fattening, pig raising and semi-scavenging chicken production were identified as appropriate demonstration models. Six demonstrations were agreed for each RUDEP Commune; 36 demonstrations in total.

In lowland Communes<sup>2</sup>, two cattle fattening, two pig raising and two semi-scavenging chicken production models were designed. Four pig raising and two semi-scavenging chicken production demonstrations were implemented in Son Hai Commune. Cattle demonstrations were not implemented in Son Hai because the preference of households was to raise pigs. In Nghia Tho Commune, two improved cattle raising (in sheds), two pig raising and two semi-scavenging chicken production demonstrations were implemented.

All demonstration activities were coordinated and implemented by the PAEC with support from RUDEP, CPCs and the Livestock Activity Groups. Demonstration households were identified by the Livestock Activity Groups and agreed to implement the technical requirements of the demonstrations. Efforts to coordinate activities were assisted by weekly coordination meetings between PAEC and RUDEP and the submission of monthly progress reports. Progress was monitored by demonstration households by recording all inputs and problems.

Evaluation of the livestock demonstrations was considered an important activity to ensure that future livestock demonstrations take into account lesson learned. This was conducted by Final Technical Reports of PAEC outlining the results of the demonstrations. *Ad-hoc* evaluations were conducted by the RUDEP MEGO and MEGO Assistant and evaluated each demonstration against demonstration objectives. A Final Review Workshop was held with RUDEP, PAEC, CPC Officials and demonstration households. This Report highlights the results of the demonstrations, all evaluation activities undertaken and implications for future livestock demonstration and training activities.

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<sup>1</sup> Tinh Tho Commune (Son Tinh District); Hanh Phuoc Commune (Nghia Hanh District); Pho Chau Commune (Duc Pho District); Duc Phong Commune (Mo Duc District); Son Hai Commune (Son Ha District); and, Nghia Tho Commune (Tu Nghia District).

<sup>2</sup> Duc Phong, Tinh Tho, Hanh Phuoc and Pho Chau Communes.

## 2 Background

The PAEC was identified as the most appropriate agency to implement livestock demonstrations in RUDEP Communes due to their familiarity with the demonstration models being promoted. Discussions between RUDEP and PAEC eventuated with a Terms of Reference being drafted that formed a foundation for discussing contractual and implementation arrangements. A contract was signed between RUDEP and PAEC in April 2003 to implement the 36 livestock demonstrations in six RUDEP Communes.

### 2.1 Cattle Finishing Demonstrations

Cattle finishing is considered a viable and profitable income generating activity for poor rural households as beef are strong and relatively stable. The current preference of households is to engage in cattle breeding; however, it was agreed that cattle finishing has a potentially higher profit level with lower disease and production risks. The objectives of the cattle finishing demonstrations were as follows:

- Reduce the cattle finishing period from five to six months to two months by introducing and using high quality feed rations;
- Provide training to households on animal health technologies, cattle husbandry and cattle fattening technologies; and
- Provide a net profit of at least 400,000 VND per animal after two months with low production and disease risks.

Cattle fattening demonstrations were implemented in four RUDEP lowland Communes; Tinh Tho, Duc Phong, Pho Chau and Hanh Phuoc. Two demonstrations were implemented in each Commune.

### 2.2 Pig Raising Demonstrations

Pig raising provides a high proportion of annual household income with most rural households engaged in semi-intensive pig production (1 – 10 pigs). Opportunities were identified to increase production efficiency and introduce technologies to produce lean pigs that obtain a premium market price. The objectives of the pig raising demonstrations were as follows:

- Provide a net profit of between 30,000 VND to 200,000 VND per pig over a four to five month raising period;
- Reduce production risks due to improved disease control and vaccinations;
- Produce leaner pigs through the use of a high quality ration; and
- Reduce labour input requirements to raise pigs, especially for women.

Pig raising demonstrations were implemented in all six RUDEP Cycle 1 and Cycle 2 Communes. Two demonstrations were implemented in lowland Communes and Nghia Tho, whilst four pig raising demonstrations were implemented in Son Hai Commune. Two pigs were raised by each demonstration household; F1 or F2 pigs in lowland Communes and Nghia Tho Commune, and one F1 and one local pig (Mong Cai) in Son Son Hai Commune.

## 2.3 Semi-Scavenging Chicken Raising Demonstrations

Chicken raising is undertaken by the majority of rural households using low technology extensive production systems. Few households cultivate chickens at a semi-intensive or intensive level. Semi-scavenging chicken models, using local chicken varieties, were considered an appropriate model because of opportunities to increase production efficiency, the resilience of local chicken to many diseases and premium market prices. The objectives of the semi-scavenging chicken demonstrations were as follows:

- Provide a net profit of between 300,000 VND and 780,000 VND for a 50 bird enterprise after six months<sup>3</sup>;
- Emphasize improved production of broiler chickens for meat from existing birds through:
  - Disease control;
  - Confinement and the use of coops and runs; and
  - Supplementary feeding to increase growth rates.

Two semi-scavenging chicken production demonstrations were implemented in all 6 RUDEP Cycle 1 and Cycle 2 Communes. Demonstrations in lowland Communes raised 50 birds. The demonstrations in each upland ethnic minority Communes (Nghia Tho and Son Hai Commune) raised 30 birds.

## 2.4 Terms of Reference and Gross Margins

Terms of Reference were drafted between RUDEP and PAEC for each demonstration model and are attached in Annex 1. Each demonstration included 4 Field Days (half-day training events) and 1 Study Tour for Activity Group members. Gross margins were drafted, including the objectives of the demonstrations and a comparison between demonstrations technologies and traditional raising practices, and are attached in Annex 2.

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<sup>3</sup> Based on the assumption that all chickens were sold and mortality rates ranged from 10 – 20%.

## 3 Final Demonstration Completion Reports

Final Completion Reports were prepared by PAEC upon the completion of the demonstrations. These reports outlined all expenditure, weight gains and profit levels for each demonstration. Key tables from these reports are attached in Annex 3 of this Report.

### 3.1 Cattle Finishing Demonstrations

#### 3.1.1 Cattle Purchased for Finishing

Eight demonstration households finished 16 cattle in total; 2 cattle finished by each household. Annex 3 illustrates the results from each demonstration household. The average purchase weight of skinny cattle was 195 Kg and varied from 140 – 236 Kg (15 Kg higher than the average purchase weight estimated in the gross margin)<sup>4</sup>. The average age of cattle was 4 years with ten local cattle and 6 crossbred Laisin cattle purchased<sup>5</sup>. The projected purchase price per Kg of livestock was 12,000 VND; however the average price paid by demonstration households was 15,659 VND. The purchase price varied from 2,150,000 VND (163 Kg beast) to 3,600,000 VND (210 Kg beast). The average purchase price (2,917,000 VND) was 757,000 VND higher than projected. Difficulties were encountered in purchasing skinny cattle due to a lack of knowledge of households on where to purchase cattle and the preference to purchase larger cattle and bulls.

#### 3.1.2 Technical Results and Conclusions

The Final Technical Reports from the PAEC and the data recorded from the demonstration farmers revealed:

- The difference in live weight price between skinny and finished cattle was insignificant (15,159 VND for skinny cattle and 15,350 VND for finished cattle). The average purchase price of skinny cattle was higher than market prices at the start of the demonstrations.
- Profits were low for households that finished cattle for a period of more than 70 days. This demonstrates that the finishing period should be applied for a maximum of 60 days. After 60 days, the cost of feed, for maintenance rather than growth, reduces overall profit.
- All demonstration households obtained a profit from one or both animals. The maximum profit obtained from one household for one beast was 948,000 VND.
- Selling cattle presented difficulties for households in some locations. This increased the cattle fattening period and feed intake and costs, and therefore reduced profit levels. A lack of marketing skills when selling cattle presented some problems for households. Some additional marketing problems were also identified:
  - Prices decreased slightly at the time the demonstrations were completed;
  - Some cows were pregnant and households wanted to keep them rather than sell them; and
  - Collusion occurred between abattoirs and traders to reduce selling price when buyers knew that the cattle were demonstration beasts.

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<sup>4</sup> Cattle were measured using tapes (calibrated as a result of Vietnamese research) and the actual weight of cattle (measured using accurate scales) may differ slightly.

<sup>5</sup> Some of these cattle were not Laisind breeds and instead were F1 milk breeds (bulls).

The results demonstrated that cattle fattening can be a lucrative income generating activity for poor households. Investment in finishing and ration concentrates over a 50-day raising period will bring high economic returns. Funds available for the purchase of cattle was considered low; the preference of households and the PAEC is to finish larger framed and hybrid cattle due to a market premium existing for hybrid cattle. However, there is no market premium for hybrid beef meat. This level of investment is high and beyond the resources constraints of poor households unless credit is easily available. Emphasis needs to be placed instead on local cattle (cheaper per Kg price than hybrid cattle) with complementary activities to increase the marketing skills and awareness of households. These marketing activities need to be incorporated further into demonstration activities to assist households to increase profit levels. This would involve cattle scoring technologies and weight estimation methods. Such activities will assist households to purchase and sell cattle for fair market prices.

## 3.2 Pig Raising Demonstrations

### 3.2.1 Pigs Purchased for Pig Raising Demonstrations

Fourteen demonstration households raised 28 pigs in total; 2 pigs raised by each household. Annex 3 illustrates the pig raising demonstration results from each demonstration household. F1 pigs were typically raised in Tinh Tho, Duc Phong Hanh Phuoc and Nghia Tho Communes due to their suitability for finishing purposes. In Pho Chau Commune, each pig demonstration household raised one F1 and one F2 pig. The four demonstration households in Son Hai Commune raised one F1 pig and one local Mong Cai; all Mong Cai pigs were males.

### 3.2.2 Technical Results and Conclusions

The Final Technical Reports from the PAEC and the data recorded from the demonstration farmers revealed:

- The majority of households chose rations 1, 2 or 3 (or adopted these with slight variations). These rations largely contain cassava (up to 60%), rice bran (up to 30% and fish meal (30% in rations for 10 – 30 Kg pigs and 15% in 60 – 90 Kg pigs). Rations 1 and 2 do not contain any maize; ration 3 contains up to 30% ground maize.
- The average per kilogram cost of feed was 2,897 VND (ranging from 2,619 VND to 3,454 VND) in lowland Communes and 2,721 VND in Nghia Tho and Son Hai Communes (ranging from 2,574 VND to 2,877 VND). Rations 1 and 2 were the cheapest rations (2,733 VND/Kg and 2,739 VND/Kg respectively). Ration 3 and 5 were most expensive feeds (2,942 VND and 3,051 VND per kilogram) and contain the highest amount of maize.
- The duration of the finishing period varied between households. The average duration was 120 days and ranged from 105 days (Tinh Tho Commune) to 140 days (Pho Chau Commune). Extended finishing periods were due to slower than expected weight gains in pigs and resulted in higher levels of feed and feed costs.
- The average weight gain in pigs in lowland Communes was 63.6 Kg (ranging from 38.5 Kg to 78 Kg) with an average sale weight of 78 Kg. The average weight gains in pigs in Nghia Tho and Son Hai Communes was 52.8 Kg and ranged from 43 Kg to 66 Kg. The average sale weight of pigs in upland Communes was 63.9 Kg. These figures were lower than projected estimates.
- F1 pigs had higher live weight gains than F2 and local Mong Cai pigs; the average weight gain and FCE of F1 pigs were 68 Kg and 3.3 respectively. F2 pigs, raised in

Pho Chau Commune only, obtained an average weight gain of 50 Kg with an FCE of 4.7. Local Mong Cai pigs raised only in Son Hai Commune obtained an average weight gain of 45 Kg with an FCE ranging from 3.8 to 4.1).

- The average sale price of pigs in lowland Communes was 8,669 VND/Kg and ranged from 6,708 VND/Kg to 10,000 VND/Kg. No information or estimates were taken on the muscle or fat content of the pigs. A sharp decline in the price of pork at the time of sale meant that per kilogram pork prices were up to 3,000 VND less than projected estimates.
- The sharp decline in the pork market meant that the average loss per pig in lowland Communes was 258,891 VND and 156,225 VND in Nghia Tho and Son Hai Communes.

The profitability of the pig raising demonstrations was affected by three main factors: the sharp decline in the market price of pork; high feed costs; and, the low live weight gain of many pigs. The market price of pork dramatically declined from 13,000 VND/Kg to a maximum of 9,000 VND for lean pork. Projected profit margins were slim and assumed a high sale price that reflected the market premium for lean pork. Using the average per kilogram feed costs in the demonstrations (2,900 VND/Kg), the per kilogram sale price would need to be 12,000 VND/Kg for an 80 Kg pig for households to break even.

The demonstrations obtained an impressive average FCE level of 3.4 Kg for all pigs; the average FCE for F1 pigs was approximately 3.1 Kg. Using these average FCE levels, the amount of feed fed to pigs was insufficient and did not allow the pigs to obtain a sale weight of between 80 – 90 Kg. This highlights the probability that the pigs were only fed concentrates with very little or no supplementary feeds added. If a weight of 80 – 90 Kg for a finished pig is desirable, between 220 Kg and 255 Kg of feed is required using the average FCE of 3.4 Kg. Therefore, assuming 125 Kg of feed concentrates is fed to pigs, an additional 100 Kg of supplementary feed is needed (e.g. rice bran, broken rice, etc.). This additional expense for 100 Kg of feed, in combination with the high cost for feed concentrates would make pig raising activities highly unprofitable. Efforts need to be made to raise feed amounts (in terms of total per Kg intake) whilst reducing unit feed costs. FCE and weight gain per day would be potential trade offs encountered when taking this approach.

### **3.3 Semi-Scavenging Chicken Raising Demonstrations**

#### **3.3.1 Chickens Purchased for the Demonstrations**

Twelve demonstration households implemented the semi-scavenging chicken production models; 2 demonstration households in each Commune. Demonstrations in lowland Communes raised 50 birds while demonstrations in Nghia Tho and Son Hai Communes raised 30 birds. Annex 3 illustrates the semi-scavenging chicken raising demonstration results from the data recorded by demonstration farmers. The demonstrations aimed to promote locally available chicken raising technologies; however, difficulties were encountered with sourcing local chicks because of the limited number of suppliers in Quang Ngai Province. The purchase price of 1-day old chicks was 4,000 VND per chick. In Nghia Tho and Son Hai Communes, the purchase price of 15-day old chicks was 7,000 VND.

### 3.3.2 Semi-Scavenging Chicken Raising Rations

In all demonstrations, 1 – 30 day old chicks were fed 100% industrial feeds (3,600 VND/Kg). From 2 – 6 months of age, the feed rations varied between demonstration sites. Unit cost of feed varied between Communes; 2,645 – 2816 VND/Kg for 2 – 3 month chicks and 2,479 – 2,746 VND/Kg for 4 – 6 month chicks. Despite the large quantities of feed concentrate used, some feed shortages were encountered. It was anticipated that older chickens would derive up to 30% of feed from scavenging. However, runs were typically heavily used with little green matter available. This problem was overcome by households contributing extra feed to support the demonstrations.

### 3.3.3 Levels of Mortality

Vaccinations were given to all birds in all demonstrations for Newcastle Disease, Gumbaro, Fowl Pox, and, Fowl Cholera. Vitamins, anti-helminthics and antibiotics were also given to chicks to increase growth rates and health. The vaccinations and improved animal health technologies meant that only 54 out of 520 birds died (10.4% mortality). Mortality was highest in chickens from 1 – 3 months of age and due to intestinal infections (probably Coccidiosis). Deaths in chickens from 4 – 6 months of age were due to Fowl Cholera (and Newcastle Disease in some locations). Additional bird losses were caused by predation (rats) and theft. Households perceived that mortality of demonstration birds was much lower than other households (unvaccinated birds). The average mortality of birds for all demonstrations in lowland Communes was 16% (8 birds out of 50). The average mortality was 18% in upland Communes (5 birds out of 30).

### 3.3.4 Technical Results and Conclusions

The Final Technical Report submitted by the PAEC and the data recorded by the demonstration households revealed that:

- The average amount of feed consumed for 50 chickens per demonstration in lowland Communes was 474 Kg (for 2 – 6 month old chickens). The average cost of the feed was 1,388,725 VND (2,663 VND/Kg); a cost of 17,878 VND/Kg of Live Weight gain (an average FCE of 6.1 Kg).
- The average amount of feed consumed for 30 chickens per demonstration in upland Communes was 260 Kg (for 2 – 6 month old chickens). The average cost of the feed was 756,550 VND (2,697 VND/Kg); a cost of 13,614 VND/Kg of Live Weight gain (an average FCE of 4.9).
- The average weight of each bird upon the completion of the demonstrations was 1.8 Kg in lowland Communes and 2.3 Kg in upland Communes.
- Per kilo sale price of birds ranged from 22,000 VND to 13,486 VND in lowland Communes. Demonstration households that sold birds for 22,000 VND made a profit.
- Per kilo sale price of birds in upland Communes ranged from 22,000 VND to 18,125 VND. Demonstration households in Son Hai Commune made a loss with birds sold for less than 19,000 VND/Kg. In Nghia Tho Commune, all birds were sold for 22,000 VND/Kg; chickens had an average weight of 2.5 Kg.
- Only 3 lowland semi-scavenging chicken raising demonstrations returned a profit; 1 demonstration in Tinh Tho, and 2 demonstrations in Hanh Phuoc Commune. The profit of these demonstrations ranged from 191,853 VND to 67,633 VND; 4,568 VND to 1,503 VND per bird respectively.

- Of the 8 lowland semi-scavenging chicken demonstrations, 5 demonstrations made a loss. Losses ranged from 1,091,900 VND to 14,500 VND. Demonstrations with finished chickens that sold for less than 20,000 VND/Kg made a loss (e.g. Pho Chau Commune). In other Communes, high mortality rates (above 20%; 10 birds) resulted in a demonstration loss.

Two main factors affected the profitability of semi-scavenging chicken production models: the per kilogram sale price of birds; and levels of mortality or theft. The average per kilogram sale price of birds was 20,000 VND/Kg with some households obtaining a sale price of 22,000 VND/Kg. The market price of industrial chickens, as were raised in Pho Chau Commune, obtained a price of 14,000 VND/Kg to 18,000 VND/Kg. A market premium exists for local quality birds and these should be promoted in future demonstrations. Demonstration households that obtained a sale price of 22,000 VND/Kg had a high probability of making a profit. Mortality rates above 20% left demonstration households with difficulties in obtaining a profit; even with a high sale price. Demonstration households that had low levels of mortality and sold birds at a high price have a high probability of making a profit.

### 3.4 Conclusions and Recommendations

The Final Technical Reports by PAEC provided the following recommendations to RUDEP:

- Results were better in Communes where the CCG members and paravets were enthusiastic, delegated work specifically to each of the CCG member and facilitated participation from the Mass Movement associations.
- The PAEC and RUDEP need to collaborate closer to identify and agree on specific criteria for selecting demonstration farmers. Some implementation difficulties encountered and poor demonstration results were considered due to the age, educational levels, health and economic circumstances of demonstration households.
- Activity Groups should be formed by identifying the needs and interest of members and ensuring these closely match the demonstration models so that participating households are in a position to adopt the technologies introduced.
- Importance should be placed on linking households to market outlets and input suppliers.
- VSCFs need to establish quickly and shortly before the completion of the demonstration. This will facilitate a source of credit for households to adopt the techniques transferred following the demonstration.
- RUDEP would benefit from a livestock specialist to advise, supervise and assist the PMU to manage effectively.
- Information and communication methods to transfer demonstration technologies to households should incorporate a variety of methods (e.g. newsletters, brochures etc).

The PAEC raises issues concerning working with poor households and having poor households implement demonstrations. Poor households are considered to have low education levels and have difficulties in following technical requirements. The perception of the PAEC regarding the livestock demonstrations is that households should only participate that have sufficient household resources and can adopt the demonstration technologies. This differs in the approach promoted by RUDEP in which demonstrations are tailored and designed according to the needs of the poor.

Clear differences in working approach between RUDEP and PAEC are evident. PAEC commonly implements 'demonstration models' that are rigid in design and implementation and provide little flexibility. The models are also tailored towards wealthier households with greater available resources and capacity to adopt demonstration technologies. Participatory processes and approaches to encourage the participation of households are lacking. RUDEP's envisaged approach to agricultural and livestock extension involves poor households in the design of demonstrations or trial activities and therefore encourages their participation when implementing activities. This participatory approach to extension will be pursued by RUDEP through capacity building activities for PAEC and District Extension Station staff and supported by RUDEP's Activity Group Implemented Trials.

## 4 *Ad-Hoc* Evaluation Results

All 36 livestock demonstrations were evaluated over a three month period either shortly after the completion of the demonstrations or at the final field day. Evaluations of completed demonstrations involved the MEGO, DDO and CPC Officials visiting the demonstration site and interviewing households living nearby. This involved an evaluation of the demonstrations from households that were members of the Activity Group and households that were not.

The forms used to evaluate these demonstrations are attached in Annex 4. The evaluation covered the following topics:

- Awareness of the demonstrations and attendance at field days.
- Understanding of the objectives of the demonstration.
- Adoption of the demonstration technologies.
- Labour inputs to adopt the technologies.

The *Ad-Hoc* Evaluation Results were compiled into a Final Evaluation Report.

### 4.1 Cattle Finishing Demonstrations

The *ad-hoc* evaluations the cattle finishing demonstrations revealed that:

- Awareness of the demonstrations was high. However, men were involved and more aware of the demonstrations than women, especially in Nghia Tho Commune.
- Many households attended all four field days with the attendance of men being more than women. Women were more likely to attend a limited number of field days in comparison to men.
- Households were aware of the two main objectives of the cattle finishing demonstration. However, additional benefits were perceived; cattle husbandry technologies, raising cattle in shed, shed making technologies and cultivating elephant grass.
- The number of households adopting the cattle fattening technologies is low (approximately 18%). Many households consider that they will adopt the technologies later when sufficient funds are available.
- A small number of households will adopt a modified version of the cattle fattening technologies promoted. This would mainly focus on the use of locally available feeds such as rice bran, sweet potato leaves, cassava powder, banana stem and maize powder.
- The labour inputs required to implement cattle finishing demonstrations were considered less than traditional raising methods. These reduced labour inputs were considered more significant according to women.

*Ad-Hoc* Evaluations raised the perception that households can generate income quickly through cattle finishing technologies. Less labour was required to care for cattle during grazing and 'cut and carry'. Two main reasons for households not fully adopting the cattle finishing demonstration technologies were provided: feeds (either too expensive or not available locally); and a lack of funds to fully adopt. Researching finishing rations utilising locally available products will make cattle finishing technologies more appropriate and affordable for poor households. RUDEP's involvement in the ACIAR 'Improved Beef

Production in Central Viet Nam' Project will support this approach. VSCFs also provide a source of locally available credit for poor households and should be established earlier for households to borrow funds to adopt cattle finishing technologies.

## 4.2 Pig Raising Demonstrations

*Ad-hoc* evaluations the pig raising demonstrations revealed that:

- The number of households that were not aware of the demonstrations was high, especially in upland ethnic minority Communes. Little promotion or communication within Villages was undertaken to raise the awareness and levels of participation of households.
- Women play the leading role in household pig raising activities. However, women accounted for only 50% of participants attending field days.
- The number of households attending pig training activities was often low and lower than the numbers attending cattle finishing field days. In some instances, field days were cancelled because few households attended.
- Awareness of the objectives of the pig raising demonstrations was high. Additional benefits were perceived from the demonstrations that included improved breed selection and sanitation.
- Men perceived that the demonstrations took women more time to prepare feeds; however, women evaluated the technologies as requiring much less labour in comparison to traditional raising methods (e.g. feed cooking and collecting firewood).

Discussions with households during the *ad-hoc* evaluations demonstrated that households were interested in the demonstration technologies. However, the economic benefit of the demonstrations was not shown due a sharp decline in the price of pork at the time of the sale of finished pigs. Losses, in combination with high feed costs and a lack of funds to invest in the demonstrations, meant that many households would not adopt the pig raising demonstration technologies.

## 4.3 Semi-Scavenging Chicken Demonstrations

*Ad-hoc* evaluations of the semi-scavenging chicken demonstrations revealed that:

- Chicken demonstrations were well received by women and were interested in the demonstration technologies. Women attended field days more than men.
- Men were generally less interested than women. Perceptions of chickens being a low profit enterprise and birds being susceptible to diseases meant that some households did not want to participate in the field days.
- Households were aware of the objectives of the demonstrations and perceived additional benefits of the demonstrations (e.g. reducing risks of disease).
- Approximately 17% of households would not adopt the chicken raising technologies. According to these households, the raising duration was too long and took a long time to obtain a profit.
- Spontaneous adoption of the demonstrations occurred around the locations of some demonstration sites (e.g. Hanh Phuoc Commune).

- Some households expressed that they will adopt the technologies later but required funds to invest. Other households would replace some of the feed concentrates with locally available products (e.g. maize, rice bran, sweet potatoes and water spinach).
- Demonstrations technologies required more labour inputs according to women (incubation, feeding, cleaning and vaccination); however this did not deter many households from wanting to adopt the technologies. According to many households, the increased labour inputs were offset by low mortality rates and a potentially high profit level.

The reduced mortality of demonstrations birds was considered a major benefit of the demonstrations. Many households are reluctant to invest in semi-intensive chicken production models due to a high susceptibility to diseases and mortality. This made the demonstration highly attractive to many households. However, full adoption was limited by a lack of funds or credit<sup>6</sup>. The feed concentrates were still considered expensive and some households reduce feed concentrate levels and supplement this with locally available products. Increase labour inputs are expected using a semi-intensive system because little or no labour is used in existing extensive systems.

#### **4.4 Evaluation Conclusions and Recommendations**

A number of comments from households were relayed during the evaluations. These comments provided a foundation for recommendations and inputs to future demonstration and extension activities:

- Few farmers attended all of the field days and different household members attended different field days. Each household should appoint only one household member that will attend all field days with this person committing to attending all field days.
- Many Activity Groups formed at the Village level making it difficult for many households to monitor and view the progress of the demonstrations regularly due to long distances to travel. Activity Groups should form at a Hamlet level to allow households to view the demonstration easily and involve Activity Group in monitoring the progress of the demonstration regularly.
- Much of the content of field days focused on theoretical teaching methods with little emphasis on practical approaches to transfer technologies. Many households, particularly those with low educational levels, illiterate or women, had difficulties in understanding the content of the field days. Practical training methods should be incorporated into the demonstrations with less emphasis given to theoretical lessons and materials.
- Ethnic minority households have difficulties understanding the content of technologies transferred at field days. The content is delivered in Kinh Vietnamese with little practical explanation of demonstration technologies. Visual training materials (with illustrated diagrams) should be developed and used in upland ethnic minority Communes.
- Awareness of gender roles should be incorporated into field days and training activities. Production roles that women are responsible for should be reflected in the active involvement of women when transferring technologies.

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<sup>6</sup> Levels of adoption were later reduced due to the impact of Avian Influenza.

- The enthusiasm of local CPC Officials or paravets varied between Communes. Demonstrations were considered more successful in areas where support was strong. Roles and responsibilities of different stakeholders involved in implementation need to be outlined and agreed.
- Some breeds used in the demonstrations were unfamiliar and households lacked knowledge of places to buy them. Technical staff should provide households with information on places to purchase good quality breeds. Additional emphasis should be placed on improving the production efficiency of local breeds in areas where improved or hybrids are not available.
- The rations applied, mainly concentrates, were considered above the financial resources of households. Many households lacked the funds to purchase the rations without credit. Other households felt that they would substitute some ration ingredients with locally available products. The use of locally available products as rations needs to be pursued.
- Many households face difficulties when selling and buying animals. Technologies to effectively estimate the weight of animals should be promoted (if available) to assist households to obtain a fair price when buying breeds and selling finished animals.
- Animal health technologies transferred through demonstrations needs to be deepened. Households face difficulties in understanding vaccination technologies and methods. Further information on animal health technologies, particularly preventing common livestock diseases, is justified.
- Study tours are a good way of providing marketing information, both the purchase of inputs and the sale of finished animals, and should continue to be incorporated into demonstration activities. Further emphasis needs to be given to introducing households to feed and breed distributors and buyers of finished animals.

The use of more visual and practical methods to transfer technical information to households needs to be pursued. Many households, particularly those in upland ethnic minority households, lack functional literacy and numeracy skills. More appropriate extension methods need to be incorporated into training activities to ensure that households understand technologies being delivered.

## 5 Final Review Workshop

A Final Review Workshop was held on 2 January 2004 with the participation of RUDEP DDOs, PAEC technical staff, DPC Representatives, CPC Representatives and demonstration farmers (6 demonstration farmers for each Commune). The Final Technical Reports drafted by the PAEC were presented at the Workshop and provided a foundation for discussing the results and providing recommendations for future livestock extension and demonstration activities. Commune Breakout Groups formed and discussed:

- What was good about the demonstrations and what needs to change in future RUDEP demonstration activities?
- What format, activities and approaches should future RUDEP demonstration activities incorporate?
- What are the future roles and responsibilities of Activity Groups, CPC Officials, District and Provincial Extension Centres and Officers?

Annex 5 compiles the results of the discussions and recommendations from Commune Breakout Groups.

### 5.1 Cattle Finishing Demonstrations

The Commune Breakout Groups raised the following opinions related to RUDEP cattle finishing demonstration activities:

- Cattle finishing is considered efficient and profitable.
- The supporting forage cultivation technologies were applicable for local households.
- Future cattle finishing demonstrations should focus on bulls and hybrid cattle.
- Feed rations should utilise locally available feeds where industrial feeds and concentrates are not sold.
- Paravets should provide more support to demonstration households.
- Training methodologies should utilise practical training methodologies with visual training materials.
- Increased information on animal health should be transferred to households at field days.
- Demonstration households should play a greater role in the purchase of feeds.

Further expansion of the cattle finishing technologies was recommended by participants at the Final Review Workshop. Cattle finishing is viewed as a profitable income generating activity with complementary forage/fodder cultivation considered appropriate for households.

### 5.2 Pig Raising Demonstrations

The Commune Breakout Groups raised the following opinions related to RUDEP pig raising demonstration activities:

- The pig raising demonstrations provided good and efficient technologies that are appropriate for women.

- Future pig demonstrations should increase the number of pigs raised, use larger farmed pigs and improve hygiene levels.
- Sow raising technologies should be promoted in future demonstrations.
- In Nghia Tho and Son Hai Communes, the demonstration technologies reduced labour requirements of women. Households in these Communes recommended that future pig demonstrations should promote F1 pigs and sow raising.
- Upland ethnic minority households face difficulties in adopting all of the demonstration technologies. Much of the ration ingredients and veterinary medicines are not available in these Communes.

Further expansion of pig raising models was recommended in all Communes. This should be supported with pig breeding technologies. Such an activity will contribute to increasing the availability of F1 breeds suitable for finishing. Pig breeding has strong potential in upland ethnic minority Communes where a shortage of pigs exists and households have to travel long distances to purchase pigs. RUDEP is currently implementing 8 pig raising demonstrations in four lowland Communes. Expanding these demonstrations to Son Hai and Nghia Tho Communes with appropriate technologies for poor households is justified.

### **5.3 Semi-Scavenging Chicken Raising Demonstrations**

The Commune Breakout Groups raised the following opinions related to RUDEP pig raising demonstration activities:

- The chicken raising demonstrations provided good technical guidance and training, sufficient feed amounts and was considered a profitable activity.
- Efficient veterinary technologies reduced deaths due to common diseases.
- Future demonstrations should reduce the raising period to 4-5 months to maximise profit levels.
- Incubation technologies are recommended in areas where chicks are limited locally.
- Chicken breeds need to be promoted that obtain a market premium. Current trends suggest that local chickens are preferred by consumers; though they are difficult to buy locally and differentiate from industrial chickens at 1 – 7 days old.
- Training methodologies should utilise practical training methodologies with visual training materials.
- Increased information on animal health should be transferred to households at field days.
- In Son Hai and Nghia Tho Commune, the demonstrations were considered to be low labour, have high quality feeds and use good quality varieties.

Opportunities exist to improve and further expand semi-scavenging chicken production models. The transfer of disease control and vaccination technologies makes the enterprise attractive for many rural households. Emphasis needs to be placed on selecting local chicken varieties that obtain market premium. In areas with limited chick supply or far away from markets, the introduction chicken incubation technologies is recommended.

## 5.4 Implementation Recommendations

The Final Evaluation Workshop provided a number of general recommendations regarding implementation arrangements and training approaches for future demonstration activities.

- The use of locally available feeds, in all livestock demonstrations, should be investigated and promoted. Many households face difficulties in adopting the demonstration technologies because feeds are not available locally or are beyond the resources of poor households.
- Animal health technologies need to be further incorporated into demonstration activities. This training should be practical information rather than theoretical in approach.
- Support to demonstration households needs to increase. Demonstrations implemented with little support from Provincial Technical Officers and Commune paravets creates difficulties in understanding many of the demonstrations activities, technologies and husbandry requirements.
- Study tours provided an opportunity for households to view input suppliers and non-RUDEP demonstration sites. Recommendations were given to increase the number of study tours, particularly in upland ethnic minority Communes, and allow households to view more input and breed suppliers.
- Training methodologies should utilise more visual and practical training approaches. This is particularly necessary in upland ethnic minority Communes where illiteracy levels are high and Kinh Vietnamese language skills are limited.
- Difficulties were encountered implementing demonstrations with poor households according to PAEC. They are considered to have little knowledge and lack skills to communicate technologies to other households in the Commune.
- Levels of adoption are likely to increase if VSCFs establish prior to the completion of the demonstrations. This will provide a source of funds for households to borrow to adopt technologies.

The results of the discussions at the Review Workshop provided recommendations that will involve a change in future design and implementation approach. These changes focus on a greater interaction with households when designing demonstration activities to ultimately lead in a greater level of participation of households in implementation. This increased participation of households will lead in the design of demonstrations that are more appropriate to poor households. The delivery of training using more visual and practical methods, in combination with pro-poor technologies, will lead to increased levels of adoption by households.

## 6 Conclusion and Main Findings

The analysis of the Final Technical Report of the PAEC, Livestock Demonstration Evaluation Report and Final Review Workshop provided the following conclusions and recommendations:

- Cattle finishing is a profitable income generating activity (average of 324,000 VND per beast over a 64 day finishing period) for poor households provided that credit is available to facilitate adoption. Future demonstration and training activities should incorporate weight estimation and muscle scoring to assist households to obtain fair market prices.
- Pig raising is a highly risky enterprise leaving households vulnerable to market shocks. Though current pork prices are higher than late-2003 levels, households will still be vulnerable to future price fluctuations. Reducing input costs, particularly feed costs, will need to be pursued. Any use of concentrates, or at least a reduction in concentrate feed amounts, needs to be supplemented with additional feeds comprising largely of locally available products.
- Semi-scavenging chicken raising models are profitable if mortality is low and local chicken varieties are raised. Reducing the raising period will increase potential profit levels if adequate supplementary or scavenging feed is available. Increased care is needed during the first 30 days of raising to reduce chicken mortality. Sourcing local chickens is difficult in some Communes; the promotion of simple egg incubation and chick raising technologies is justified and recommended.
- Reducing feed costs in demonstration activities will need to be pursued. This would involve a greater emphasis on the use of locally available feeds, increased involvement of demonstration households in purchasing feeds and promoting simple agro-processing equipment to process livestock feed rations. Current involvement of RUDEP in the ACIAR 'Improved Beef Production in Central Viet Nam' and the assessment of local feed resources under this project will support this approach.
- Training provided by PAEC is largely theoretical in approach with little practical information transfer applied. This limits the ability for households to understand all technologies and information promoted. This is particularly the case for women, ethnic minorities and people low education and literacy/numeracy skills. RUDEP's initiative to build the training and extension skills of Provincial and District Extension staff is strongly justified and supported.
- The animal health training provided through the demonstrations was considered insufficient and largely theoretical. Households request further training on animal health technologies to reduce production risks. RUDEP's current Animal Health Training for VSCFs, provided by the Provincial Sub-Department of Animal Health, is addressing this request and will provide deeper and more practical information to prevent and control livestock diseases.
- The current approach to extension or technology transfer applied by the PAEC applies the use of 'models'. These demonstration models often lack flexibility and rarely apply participatory approaches. Rural households and farmers are natural experimenters with 'trial-based' extension activities, facilitating the comparison of traditional practices with new technologies, a more appropriate extension delivery method. A major shift in extension approach is needed and will supported by RUDEP through Participatory Extension Methodologies training to promote participatory planning of demonstration and trial activities with rural households. RUDEP's AGITs will support the introduction and implementation of such an approach.

- Women play a critical role in household livestock production. Understanding the production roles of men and women is important and should be reflected in attendance and participation in demonstrations and training events. RUDEP is initiating a Study on Gender Roles and Responsibilities in Program Communes. The results of this Study should be transferred to implementing agencies to ensure that women attend training events for production activities they are responsible for (and *vice-versa* for men).
- Many households lack the financial resources to adopt demonstration technologies. For many of these households, VSCFs remain the most viable and locally available source of credit. Increased adoption rates would occur if VSCFs established before, or shortly after, the completion of demonstration activities.

The results of the RUDEP's first round of livestock demonstration activities highlighted a number of problems that RUDEP is currently addressing. Participatory approaches to extension need to be pursued and be supported with capacity building activities and training for District and Provincial Agricultural Extension officers. Increased participation of households, particularly the poor, will need to be incorporated into such an approach to involve households in the design and implementing of demonstration and extension activities more appropriate to their needs and resource constraints. Discussions between RUDEP and DARD are now being initiated and resources have been allocated in the 2004 – 2005 Annual Plan to support such a capacity building program.

## **Annex 1**

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### **Terms of Reference**

## Annex 1: Terms of Reference

### Cattle Finishing Demonstrations

#### Background

<u>Location:</u>	Duc Phong, Tinh Tho, Hanh Phuoc and Pho Chau Communes
<u>No. of Demonstrations/Commune:</u>	2 Demonstrations/Commune (8 Demonstrations in Total)
<u>No. of Cattle/Demonstration Site:</u>	2 Cattle/Demonstration Site
<u>Activity Groups/Demonstration:</u>	1 Activity Group/Demonstration (~ 25 farmers)

#### Terms of Reference

- In collaboration with the Australian and Vietnamese Participatory Development Advisors (PDAs), design and outline the husbandry techniques and production model to be promoted in the cattle fattening demonstrations in each of the communes (2 demonstrations per commune).
- In collaboration with the Australian and Vietnamese PDAs, outline the list of equipment/materials (e.g. equipment required for the demonstration) and supplies (e.g. feeds, medicines etc.) required for the cattle fattening demonstrations and submit to the list to the Program for approval and reimbursement.
- Assist the District Development Officers (DDOs) in each of the communes to select demonstration sites, demonstration farmers and farmers to attend the field demonstration days.
- Once demonstration farmers have been identified, outline contractual arrangements with each demonstration farmer to ensure that they adhere to the requirements of the cattle fattening demonstration and the reporting requirements.<sup>7</sup>
- Assist the demonstration farmers and the Program to purchase cattle suitable for the cattle fattening demonstrations based on previous experience from QNRDP in implementing the demonstrations.
- Once suitable cattle have been purchased for each demonstration site/farmer, ensure that cattle are inspected by a suitably qualified vet and receive treatments and vaccinations for the health problems listed in Table 3.

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<sup>7</sup> Demonstration farmers will not receive payment for their involvement in the cattle fattening demonstrations; they will only receive profit obtained from the demonstration upon the sale of finished cattle.

**Table 1: Treatments and Vaccinations given to Demonstration Cattle prior to Implementing Demonstrations**

Treatment	Disease/Health Problem	Administration	Price (VND)
THT Vaccine	Pasteurellosis	Injection	16,000/commune
Ploymix or Vime Iodine	Antiseptic/Sterilisation of sty equipment	Spray	10,000/HH
Ivermectin	Lice/Scabies	Injection	15,000/HH
Dovenix or Fasiolid	Liver Flukes	Injection	25,000/HH
Antibiotics	Pasteurellosis, E. coli	Injection	22,000/HH

- Give training courses to demonstration farmers and interested activity group members at the demonstration sites (2 days/demonstration farmer) for each demonstration model on the technology to be promoted and husbandry requirements (e.g. proper mixing of feeds, daily cleaning of pens, etc.) in order to ensure that the demonstrations are implemented correctly.
- In collaboration with demonstration farmers and RUDEP, design recording forms to record information on weight gains (weekly), feed consumption rates (daily) and any production problems encountered and ensure that demonstration farmers understand how to record information in these forms.
- Ensure that the feed ration to be promoted by the Program is followed (as given in Table 4) and any problems raised regarding feed availability, access or cost are raised and resolved urgently.

**Table 2: Feed Ration promoted under the Cattle Finishing Demonstrations**

Ingredient	Ration Formula (%)				
	Formula 1	Formula 2	Formula 3	Formula 4	Formula 5
Cassava Starch	85	85	65	65	70
Maize Powder	-	-	25	25	-
Rice Bran	-	-	-	-	20
Fish Meal	5	5	5	-	5
Dry Soy	5	-	-	5	-
Urea	3	3	3	3	3
Salt	1	1	1	1	1
Bone Powder	1	1	1	1	1

- Establish the demonstrations and conduct monitoring missions (twice per week to each demonstration site) to each of the communes to ensure that the demonstration farmers are following the specifications and requirements of the demonstration model.
- Ensure that cattle are weighed weekly and weight gains are recorded by demonstration farmers.
- Ensure that daily feed consumption rate are recorded by demonstration farmers.

- Respond quickly to any production problem or other issues and record the problem that arose (e.g. health problems) that are raised by the PDAs, DDOs or demonstration farmers throughout the duration of the demonstration.
- Conduct 4 farmer field demonstration days at each demonstration site and provide answers and follow-up to any issues, problems or queries raised by farmers attending the field demonstration days.
- Liaise with the Australian and Vietnamese PDAs and DDOs throughout the implementation of the demonstrations and raise any issues or problems encountered and make changes if these are proposed and agreed by both parties.
- Provide monthly reports on the demonstration progress and a final completion report upon the completion of each demonstration (including the results of each demonstration) complete with recommendations and the results of the farmer field demonstrations.
- Participate in a comprehensive review of the demonstrations in order to modify and improve future livestock demonstrations and extension activities.

## **Cattle Raising Demonstrations; Son Hai and Nghia Tho Communes**

### **Background Information**

<u>Location:</u>	Son Hai and Nghia Tho Communes
<u>No. of Demonstrations/Commune:</u>	2 Demonstrations/Commune (4 Demonstrations in Total)
<u>No. of Cattle/Demonstration Site:</u>	1-4 Cattle/Demonstration Site (depending on the number of cattle owned by the demonstration farmer)
<u>Activity Groups/Demonstration:</u>	1 Activity Group/Demonstration (~ 25 farmers)

### **Terms of Reference**

- In collaboration with the Australian and Vietnamese Participatory Development Advisors (PDAs), design and outline the husbandry and construction techniques to be promoted in the fodder conservation and penning demonstrations.
- In collaboration with the Australian and Vietnamese PDAs and District Development Officers (DDOs), outline the list of equipment/materials (e.g. equipment required for the demonstrations and farmer field days) and supplies (e.g. local materials etc.) required for the fodder conservation and penning demonstrations.
- Assist the District Development Officers (DDOs) to select demonstration sites, demonstration farmers and farmers to attend the field demonstration days.
- Once demonstration farmers have been identified, outline contractual arrangements with each demonstration farmer to ensure that they adhere to the requirements of the fodder conservation and penning demonstrations.
- Assist the demonstration farmers and the Program to purchase and/or arrange materials suitable for the fodder conservation and penning demonstrations based on previous experience from RUDEP in implementing demonstrations.
- Once the required materials have been purchased and/or arranged with each demonstration farmer, plan the demonstration field days for each demonstration site.
- Give preliminary training to demonstration farmers for each demonstration model on the technology to be promoted and husbandry requirements (e.g. what needs to be done during these demonstrations) in order to ensure that the demonstrations are implemented correctly.

- In collaboration with the demonstration farmers and RUDEP, ensure that farmers understand the demonstrated technology at the end of the demonstration period.
- Establish the demonstrations and conduct monitoring missions (*twice per week to each demonstration site*) to ensure that demonstration farmers are following any specifications and requirements of the demonstration model.
- Respond quickly to any problem or other issues and record the problems that are raised by the PDAs, DDOs or demonstration farmers throughout the duration of the demonstration.
- Conduct farmer field demonstrations days in such a way as to teach the skills and knowledge required to conserve fodder and/or construct appropriate stalls at each demonstration site and provide answers and follow-up to any issues, problems or queries raised by farmers attending the field demonstration days.
- Liaise with the Australian and Vietnamese Participatory Development Advisors (PDAs) and DDOs throughout the implementation of the demonstrations and raise any issues or problems encountered.
- Provide monthly reports on the demonstration process and a final completion report upon the completion of each demonstration complete with recommendations and the results of the farmer field demonstrations.
- Participate in a comprehensive review of the demonstrations in order to modify and improve future livestock demonstrations and extension activities.

## **Pig Raising Demonstrations**

### **Background Information**

<u>Location:</u>	Duc Phong, Son Hai, Hanh Phuoc, Pho Chau, Nghia Tho and Tinh Tho Communes
<u>No. of Demonstrations/Commune:</u>	2 Demonstrations/Commune (12 Demonstrations in Total)
<u>No. of Pigs/Demonstration Site:</u>	2 Pigs (F1 or Local Varieties)/Demonstration Site
<u>Activity Groups/Demonstration:</u>	1 Activity Group/Demonstration (~ 25 farmers)

### **Terms of Reference**

- In collaboration with the Australian and Vietnamese Participatory Development Advisors (PDAs), design and outline the husbandry techniques and production model to be promoted in the pig fattening demonstrations in each of the communes (2 demonstrations per commune with 4 pigs per demonstration site).
- In collaboration with the Australian and Vietnamese PDAs, outline the list of equipment/materials (e.g. equipment required for the demonstration) and supplies (e.g. feeds, medicines etc.) required for the pig fattening demonstrations and submit this list to the Program for approval and reimbursement.
- Assist the District Development Officers (DDOs) in each of the communes to select demonstration sites, demonstration farmers and farmers to attend the field demonstration days.
- Once demonstration farmers have been identified, outline contractual arrangements with each demonstration farmer to ensure that they adhere to the requirements of the pig fattening demonstration and the reporting requirements<sup>8</sup>.

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<sup>8</sup> Demonstration farmers will not receive payment for their involvement in the pig raising demonstrations; they will only receive profit obtained from the demonstration upon the sale of finished pigs.

- In collaboration with demonstration farmers and RUDEP, design recording forms to record information on weight gains (monthly), feed consumption rates (daily), pig fat levels and any production problems encountered and ensure that farmers understand how to record information in these forms.
- Assist the demonstration farmers and the Program to purchase pigs suitable for the pig fattening demonstrations (local varieties and F1 animals).
- Once suitable cattle have been purchased for each demonstration site/farmer, ensure that pigs are inspected by a suitably qualified vet and receive treatments and vaccinations for the health problems listed in Table 5.

**Table 3: Treatments and Vaccinations given to Pigs prior to Implementing the Demonstrations**

Treatment	Disease/Health Problem	Administration	Price (VND)
Tam Lien Vaccine	Pasteurellosis, Paratyphus and Pestis suum	Injection	12,000/Commune
Levamisol or Tetramisol	Roundworm	Injection or Oral	1,200/HH
Polymix or Vime Iodine	Antiseptic to sterilise the sty	Spray (pump)	10,000/HH
Ivermectin	Lice/Scabies	Injection	5,000/HH
Antibiotics	Intestinal bacteria	Drink/Feed Mix	12,000/HH
Tetramycine/Penicillin	Paratyphus	Injection	25,800/HH

- Give training courses to demonstration farmers for each demonstration model on the technology to be promoted and husbandry requirements (e.g. proper mixing of feeds, daily cleaning of pens, etc.) in order to ensure that the demonstrations are implemented correctly;
- Discuss with farmers on the feed ration to be applied in the demonstration (from the Feed Ration Tables below) to ensure that the products to be fed during the demonstrations are locally available and preferred by the farmers; and
- Ensure that the agreed feed ration to be promoted by the Program and adopted by the demonstration farmer is followed (as given in Table 6) and any problems raised regarding feed availability, access or cost are raised and resolved urgently.

**Table 4: Feed Ration Promoted under the Pig Raising Demonstrations for F1 Pigs**

Feed Mix No. and Ingredient Levels		Pig Weight (kg)		
Feed Mix No.	Ingredient	10 - 30 kg	30 - 60 kg	60 - 90 kg
1	Protein Mix	30%	20%	15%
	Cassava	55%	55%	55%
	Rice Bran	15%	25%	30%
2	Protein Mix	25%	20%	15%
	Cassava	30%	25%	30%

Feed Mix No. and Ingredient Levels		Pig Weight (kg)		
Feed Mix No.	Ingredient	10 - 30 kg	30 - 60 kg	60 - 90 kg
3	Maize	30%	25%	30%
	Rice Bran	15%	30%	25%
	Protein Mix	20%	15%	10%
3	Maize	60%	50%	50%
	Rice Bran	20%	35%	40%

**Table 5: Feed Ration Promoted by Under the Pig Raising Demonstrations for Local Pigs**

Ingredient	Pig Weight (kg)		
	10 - 30 kg	30 - 60 kg	60 - 90 kg
Protein Mix	40%	30%	20%
Cassava	60%	55%	55%
Rice Bran	-	15%	25%

**Table 6: Protein Mixed Promoted Under the Pig Raising Demonstrations for F1 and Local Pigs**

Protein Mix No.	Ingredients				
	Fish Meal	Bone Meal	Soybean	Salt	
1	100%	-	-	-	0.67
2	50%	-	50%	0.5%	0.74
3		10%	89%	1%	0.67

- Ensure that sufficient vitamin and mineral supplements are fed to animals throughout the demonstrations and farmers understand how to administer the products.
- Establish the demonstrations and conduct monitoring missions (twice per week to each demonstration site) to each of the communes to ensure that the demonstration farmers are following the specifications and requirements of the demonstration model.
- Ensure that pigs are weighed monthly and weight gains are recorded by demonstration farmers.
- Ensure that daily feed consumption rates are recorded by demonstration farmers.
- Ensure that fat levels are measured weekly in the pigs and these results are recorded by demonstration farmers.
- Respond quickly to any production problem or other issues and record the problem that arose (e.g. health problems) that are raised by the PDAs, DDOs or demonstration farmers throughout the duration of the demonstration.
- Conduct 4 farmer field demonstration days at each demonstration site and provide answers and follow-up to any issues, problems or queries raised by farmers attending the field demonstration days.

- Assist the demonstration farmers in selling the finished pigs to ensure that the highest possible price is obtained from the sale and these results are presented to the farmers attending the field demonstration days.
- Liaise with the Australian and Vietnamese PDAs and DDOs throughout the implementation of the demonstrations and raise any issues or problems encountered.
- Provide a monthly reports on the demonstration progress and a final completion report upon the completion of each demonstration (including the results of each demonstration) complete with recommendations and the results of the farmer field demonstrations.
- Participate in a comprehensive review of the demonstrations in order to modify and improve future livestock demonstrations and extension activities.

## **Semi-Scavenging Chicken Raising Demonstrations**

### **Background Information**

<u>Location:</u>	Duc Phong, Son Hai, Nghia Tho, Pho Chau and Hanh Phuoc and Tinh Tho Communes
<u>No. of Demonstrations/Commune:</u>	2 Demonstrations/Commune (12 Demonstrations in Total)
<u>No. Chickens/Demonstration Site:</u>	30-50 Local Chickens/Demonstration Site
<u>Activity Groups/Demonstration:</u>	1 Activity Group/Demonstration (~ 25 farmers)

### **Terms of Reference**

- In collaboration with the Australian and Vietnamese Participatory Development Advisors (PDAs), design and outline the husbandry techniques and production model to be promoted in the chicken raising demonstrations in each of the communes (2 demonstrations per commune).
- In collaboration with the Australian and Vietnamese PDAs, outline the list of equipment/materials (e.g. equipment required for farmer field days) and supplies (e.g. feeds, medicines etc.) required for the chicken raising demonstrations.
- Assist the District Development Officers (DDOs) in each of the communes to select demonstration sites, demonstration farmers and farmers to attend the field demonstration days.
- Once demonstration farmers have been identified, outline contractual arrangements with each demonstration farmer to ensure that they adhere to the requirements of the chicken raising demonstration and the reporting requirements.<sup>9</sup>
- Assist the demonstration farmers and the Program to purchase local chickens (e.g. 30 local chicks) suitable for the demonstrations.
- Once suitable chickens have been purchased for each demonstration site/farmer, ensure that chickens are inspected by a suitably qualified vet and receive treatments and vaccinations for the health problems listed in Table 9.

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<sup>9</sup> Demonstration farmers will not receive payment for their involvement in the chicken raising demonstrations; they will only receive profit obtained from the demonstration upon the sale of chickens and eggs.

**Table 7: Treatments and Vaccinations given to Chickens prior to Implementing the Demonstrations**

Treatment	Disease/Health Problem	Administration	Price
Variola avium	Chicken pox	Wing piercing	10,000/Commune
Lasota	Cholera in chicks (2 doses)	Eye/beak drops	20,000/Commune
Gumboro	Gumboro prevention	Eye/beak drops	20,000/Commune
Pestis anatum	Cholera in hens	Injection	10,000/Commune
Cholera avium	Cholera	Injection	15,000/Commune
Aminovit or Vitamin C & Glucose	Supplement	Mixed in water	13,000/Commune
Anticoc or Colinorgen	Coccidiosis prevention	Mixed in water	20,000/Commune
Tetracilin	Prevention of bacterial diseases	Mixed in water	35,000/Commune
Polymix or Vime Iodine	Antiseptic to sterilise coop	Spray (pump)	10,000/Commune
Piperazine or levamysol	Roundworms	Mixed in feed	2,000/Commune

- Give training courses to demonstration farmers for each demonstration model on the technology to be promoted and husbandry requirements (e.g. proper mixing of feeds, daily cleaning of pens, etc.) in order to ensure that the demonstrations are implemented correctly.
- In collaboration with demonstration farmers and RUDEP, design recording forms to record information on weight gains (weekly), feed consumption rates (daily), egg production levels, sales results (numbers of chickens sold and the price) and any production problems encountered and ensure that farmers understand how to record information in these forms.
- Ensure that the feed ration to be promoted by the Program is followed (as given in Table 10) and any problems raised regarding feed availability, access or cost are raised and resolved urgently.

**Table 8: Feed Ration promoted by RUDEP under the Chicken Raising Demonstrations**

Ingredient	Formula Proportion (%)		
	1-30 Days	31-60 Days	Over 60 Days
Mixed Feed	100	-	-
High Protein Mixed Feed	-	25	20
Maize/Bran	-	53	26
Rice	-	21	53
Premix Minerals & Vitamins		1	1

- Establish the demonstrations and conduct monitoring missions (twice per week to each demonstration site) to each of the communes to ensure that the demonstration farmers are following the specifications and requirements of the demonstration model.
- Ensure that daily feed consumption rates and the sale price for any chickens or eggs are recorded by demonstration farmers.
- Respond quickly to any production problem or other issues and record the problem that arose (e.g. health problems) that are raised by the PDAs, DDOs or demonstration farmers throughout the duration of the demonstration.
- Conduct 4 farmer field demonstration days at each demonstration site and provide answers and follow-up to any issues, problems or queries raised by farmers attending the field demonstration days.
- Liaise with the Australian and Vietnamese PDAs and DDOs throughout the implementation of the demonstrations and raise any issues or problems encountered.
- Provide a monthly reports on the demonstration progress and a final completion report upon the completion of each demonstration (including the results of each demonstration) complete with recommendations and the results of the farmer field demonstrations.
- Participate in a comprehensive review of the demonstrations in order to modify and improve future livestock demonstrations and extension activities.

## **Annex 2**

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# **Objectives and Gross Margins**

## Annex 2: Objectives and Gross Margins

### Cattle Finishing

#### Objectives

- Reduce the cattle finishing period from 5 – 6 months to 2 months by using high quality feed rations; and
- Provide a net profit of 400,000 VND per beast after 2 months with low risk.

**Table 9: Cattle Finishing Demonstrations; Differences between Demonstration Technologies and Current Farmer Practices**

Technology	Traditional Practices	Demonstration Technologies
Feed ration	Very little, if any, concentrate is used by farmers (the major source of both dietary protein and energy)	Recommended ration contains up to 50 % concentrate
Urea	Urea is not part of the animal diet	Recommended diet contains 3 % urea as a cost effective method of reducing dietary protein constraint
Pen cattle	Currently, farmers take cattle out of the stalls to graze for varying lengths of time	Cattle are kept in stalls at all times to cut down on energy use and increase weight gain
<b>Economics and Marketing</b>		
Selecting cattle	Farmers have a bias against skinny cattle; to them, skinny cattle are sick cattle	Demonstration shows that purchasing healthy skinny cattle give increased profits to farmers
Market Knowledge	Farmers have little knowledge of marketing of beef cattle	Farmers are trained and given experience in aspects of marketing that they can control and that affect their profits (eg., dealer networks)
Market power	Farmers have little market power	Farmers are taught strategies to increase their market power, eg., lot selling of cattle
Price of animals	Farmers do not know what factors determine the price they should pay for cattle or the price they should sell for	Farmers are introduced to some of these concepts (e.g. 'condition scoring')
Record keeping	Farmers do not know, or record, how much food the cattle eat and what live weight gain they get from the food that they feed to the cattle	Farmers are shown the importance of recording inputs to, and outputs from, the activity and how this can be used to make management decisions that increase profits

**Table 10: Cattle Finishing Demonstrations; Gross Margins (per beast)**

<b>Physical Performance Parameters</b>	<b>Unit</b>	<b>Amount</b>
Purchase Liveweight	Kg	180
Purchase Price	VND/Kg (LWt)	12,000
Duration of feeding	Days	60
Liveweight Gain	Kg	40
Cost of feed consumed per day	VND/Day	7,000
Labour Inputs	Days	30
<b><u>Sale of Finished Animal</u></b>		
Sale Liveweight (Live Weight)	Kg	220
Sale Price	VND/Kg (LWt)	14,000
	<b>Sale Price (VND)</b>	<b>3,080,000</b>
<b><u>Variable Costs</u></b>		
Purchase of animal	VND	2,160,000
Cost of feed	VND	420,000
Medicines (as per Annex 2)	Demonstration	76,000
	<b>Total Variable costs</b>	<b>2,656,000</b>
<b><u>Gross Margin</u></b>		
Per Fattened Cow	VND	<b>424,000</b>
Per labour day	VND/Day	<b>14,133</b>

## Pig Raising Demonstration

### Objectives

- Provide a net profit of between 30,000 VND to 200,000 VND per pig after 4 - 5 months with a low production risk;
- Reduced disease risks through vaccinations;
- Increased production of leaner pigs through the use of a high quality ration; and
- Reduced labour inputs, especially for women.

**Table 11: Pig Raising Demonstrations; Differences between Demonstration Technologies and Traditional Farmer Practices; Highland Communes**

<b>Technology</b>	<b>Traditional Practices</b>	<b>Demonstration Technologies</b>
Housing	Little or no housing of pigs	Pigs kept in pens at all times
Husbandry	Very low levels of management. Pigs usually run as backyard scavengers	Pigs are feed a high quality ration.
Growth rates	Very slow growth rates (12 months to sale)	Much faster growth rates (5 – 6 months to sale)
Fat content	Pigs with high fat content produced fat pigs	Leaner pigs are produced
Disease control	Little or no disease control	Complete disease control attempted through a vaccination schedule for all pigs
Breeds	Local breeds used	Selected local breeds used (Mong Cai)
<b>Economics/Marketing</b>		
Market preference	Farmers have little understanding of factors that affect the price of pigs	Farmers are taught about some of the factors that affect the sale price of pigs (e.g. premium for leaner pigs)

**Table 12: Pig Raising Demonstrations; Difference between Demonstration Technologies and Traditional Farmer Practices; Lowland Commune**

<b>Technology</b>	<b>Traditional Practices</b>	<b>Demonstration Technologies</b>
Feed quality	Variable levels of feed quality used	Pigs are fed a high quality ration
Growth rates	Slower growth rates with too much fat being produced	Much faster growth rates (5 – 6 months to sale)
Fat content	Pigs with high fat content produced	Leaner pigs are produced
Disease	Disease control variable	Complete disease control attempted through a vaccination schedule for all pigs
Breeds	Range of breeds used (from local to F1)	Use of F1 or preferably F2 pigs for leaner pig production and greater feed conversion ratios
<b>Economics and Marketing</b>		
Market preference	Farmers have variable understanding of factors that give a type of pig preferred by the market (lean pigs of 70 – 90 kg)	Farmers shown the factors that give lean pigs (breed and ration) and better sale prices of pigs

**Table 13: Pig Raising Demonstration Gross Margins; per pig**

	Unit	Level of Technology		
		Low	Medium	High
<b>Physical Performance Parameters</b>				
Breed of Pig		F1	F1 or F2	F2
Purchase Live weight	Kg	10	10	10
Sale Live weight	Kg	70	80	90
Live weight Gain	kg	60	70	80
Days to Maturity	days	180	165	150
Live weight Gain/day	g	333	424	533
Feed Consumed	kg	228	245	256
Feed Conversion Efficiency	Ratio	3.8	3.5	3.2
Percent of Meat in Live Pig	%	40%	45%	50%
<b>Costs and Prices</b>				
Purchase Price per kg Live weight	VND	20,000	22,000	25,000
Sale Price per kg Live weight	VND	11,000	12,000	13,000
Feed Cost per kg	VND	2,300	2,500	2,700
Cost of Veterinary Supplies/Pig	VND	15,000	20,000	30,000
<b>Gross Income</b>				
Sale of Pig	VND	770,000	960,000	1,170,000
<b>Variable Costs</b>				
Purchase of Piglet	VND	200,000	220,000	250,000
Feed	VND	524,000	613,000	691,000
Veterinary Supplies	VND	15,000	20,000	30,000
Total Variable Costs	VND	739,000	853,000	971,000
<b>Gross Margin per Pig</b>	<b>VND</b>	<b>31,000</b>	<b>108,000</b>	<b>199,000</b>
<b>Gross Margin Percentage</b>	<b>%</b>	<b>4.1%</b>	<b>12.6%</b>	<b>20.5%</b>

## Semi-Scavenging Chicken Raising Demonstrations

### Objectives

- Provide a net profit of between 300,000 VND and 780,000 VND for a 50 bird enterprise after 6 months;
- Emphasize improved production of broiler chickens (for meat) from local breeds through:
  - Disease control;
  - Confinement and the promotion of coops and runs; and
  - Supplementary feeding to increase growth rates.

Upland ethnic minority Commune demonstrations had a smaller number of birds per demonstration (30 chickens rather than the 50 chickens) and received 14-day old chicks due a lack of electricity for incubation.

**Table 14: Semi-Scavenging Chicken Raising Demonstration; Differences between Demonstration Technologies and Traditional Farmer Practices**

	<b>Traditional Practices</b>	<b>Demonstration Technologies</b>
<b>Technology</b>		
Penning	All chickens run as backyard scavengers with no supplementary feeding	Supplementary feeding of semi-scavenging birds
No. of Birds	Few birds per household	Increased numbers of birds per household
Breeds	Local breeds used	Selected local breeds used
Husbandry	Low or no levels of management	Increased levels of management
Housing	Little or no housing of chickens	Fencing and housing of chickens to reduce predation
Disease Control	Little or no disease control	Complete disease control attempted through a vaccination schedule for all birds
<b>Economics and Marketing</b>		
Productivity	Low levels of productivity (poor growth rates) result in little or no profits for farmers	Farmers shown that increased productivity gives larger and quicker profits
Market Preference	Farmers have little or no understanding of factors that affect the price of chickens	Farmers gain understanding of the factors that affect the sale price of birds (e.g. the premium for local meat chickens)

**Table 15: Semi-Scavenging Chicken Raising Demonstrations; Gross Margins; 50 local birds**

Item	Unit	Level of Technology <sup>10</sup>		
		Low	Medium	High
<b>Mortality Rate</b>	%	20	15	10
<b>Costs and Prices</b>				
Cost of Day-Old-Chicks	VND	3,000	3,000	3,000
Sale Price per kg Live Weight	VND	25,000	25,000	25,000
Feed Cost per kg	VND	2,500	2,600	2,700
Cost of Veterinary Supplies/Bird	VND	2,000	2,500	3,000
<b>Gross Income</b>				
No of Birds Sold	Bird	40	43	45
Sale of Birds	VND	1,100,000	1,381,000	1,688,000
<b>Variable Costs</b>				
Purchase of 50 Day-Old-Chicks	VND	150,000	150,000	150,000
Feed <sup>11</sup>	VND	550,000	592,000	608,000
Veterinary Supplies	VND	100,000	125,000	150,000
Total Variable Costs	VND	800,000	867,000	908,000
<b>Gross Margin per 50 Chickens<sup>12</sup></b>	<b>VND</b>	<b>300,000</b>	<b>515,000</b>	<b>780,000</b>
<b>Gross Margin Percentage</b>	<b>%</b>	<b>37.5%</b>	<b>59.4%</b>	<b>86.0%</b>

**Table 16: Semi-Scavenging Chicken Raising Models; Upland Communes; 30 Local Birds**

Item	Unit	Level of Technology <sup>13</sup>		
		Low	Medium	High
<b>Mortality Rate</b>	<b>%</b>	<b>20</b>	<b>15</b>	<b>10</b>
<b>Gross Income</b>				
No of Birds Sold	No	24	25	27
Sale of Birds	VND	600,000	625,000	675,000
<b>Variable Costs</b>				
Purchase of 30 Day-Old-Chicks	VND	90,000	90,000	90,000
Feed <sup>14</sup>	VND	330,000	355,000	365,000
Veterinary Supplies	VND	60,000	75,000	90,000
Total Variable Costs	VND	480,000	520,000	545,000
<b>Gross Margin per 30 Chickens</b>	<b>VND</b>	<b>-180,000</b>	<b>-5,000</b>	<b>235,000</b>
<b>Gross Margin Percentage</b>	<b>%</b>	<b>37.5%</b>	<b>59.4%</b>	<b>86.0%</b>

<sup>10</sup> Low, medium and high levels of technology reflect higher levels of disease control (fewer deaths) as reflected in the costs of vaccines and better growth rates.

<sup>11</sup> This reflects the cost of purchased feed only; 30% of feed is assumed to come from scavenging.

<sup>12</sup> The Gross Margin per bird ranges from 6,000 VND (low technology assuming 20% mortality rate) to 15,600 VND (high technology and 10% mortality rate).

<sup>13</sup> The RUDEP demonstrations aimed to be in the medium to high technology range. There were two differences in comparison to lowland Communes: the scale of the demonstrations (number of birds per demonstration); and, the levels of disease control and growth rate assumptions.

<sup>14</sup> This reflects the cost of purchased feed only; 30% of feed is assumed to come from scavenging.

## **Annex 3**

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# **Technical Results of Livestock Demonstrations**

## Annex 3: Technical Results of Livestock Demonstrations

### Cattle Finishing Demonstrations

**Table 17: Cattle Purchased for the Cattle Fattening Demonstrations**

Commune	Cow 1				Cow 2			
	Starting Weight (Kg)	Age (months)	Sex	Breed	Starting Weight (Kg)	Age (months)	Sex	Breed
<b>Tinh Tho</b>								
HH 1	200	36	Bull	local	210	18	Bull	laisind
HH 2	200	120	Cow	local	210	36	Bull	local
<b>Duc Phong</b>								
HH 1	182	24	Bull	local	226	30	Bull	local
HH 2	210	72	Cow	local	202	22	Bull	laisind
<b>Hanh Phuoc</b>								
HH 1	163	72	Cow	local	163	72	Cow	local
HH 2	196	72	Cow	local	189	72	Cow	local
<b>Pho Chau</b>								
HH 1	236	80	Bull	laisind	140	30	Bull	laisind
HH 2	206	20	Bull	laisind	188	36	Bull	laisind

**Table 18: Cattle Finishing Rations Applied in Demonstrations**

Commune	Formula	Unit Price (VND)	Ingredients Applied (expressed as a percentage)							
			Cassava	Rice Bran	Corn Powder	Dried Soy	Fish Meal	Urea	Bone Meal	Salt
<b>Tinh Tho</b>										
HH 1	3	1,897	65		25		5	3	1	1
HH 2	5	1,847	70	20			5	3	1	1
<b>Duc Phong</b>										
HH 1	2	2,035	85				10	3	1	1
HH 2	3	2,000	65		25		5	3	1	1
<b>Hanh Phuoc</b>										
HH 1	4	1,790	65		25	5		3	1	1
HH 2	5	1,819	70	20			5	3	1	1
<b>Pho Chau</b>										
HH 1	5	1,827	70	20			5	3	1	1
HH 2	2	1,866	85				10	3	1	1

**Table 19: Comparison of Project Results (Gross Margins) with Average Actual Results of Cattle Finishing Demonstrations**

Physical Performance Parameters	Unit	Projected Results (Gross Margins)	Actual Results (Average)
Purchase Live weight	Kg	180	195
Purchase Price	VND per Kg of LWt	12,000	15,159
Duration of feeding	Days	60	69
Live weight Gain	Kg	40	54
Concentrate Used	Kg	220	260
Cost of feed consumed per day	VND per Day	7,000	7,072
Weight Gain per Day	Grams	670	780
Cost per Kg of Live Weight Gain	VND	10,500	9,817
FCE (Kg of Feed for 1 Kg of Live Weight Gain)	Kg	5.5	5.2
<b>Sale of Finished Animal</b>			
Sale Live weight (Live Weight)	Kg	220	249
Sale Price	VND per Kg of LWt	14,000	15,350
<b>Sale Price</b>	<b>VND</b>	<b>3,080,000</b>	<b>3,818,750</b>
<b>Variable Costs</b>			
Purchase of animal	VND	2,160,000	2,950,000
Cost of feed	VND	420,000	489,905
Medicines	VND	76,000	35,519
<b>Total Variable Costs</b>	<b>VND</b>	<b>2,656,000</b>	<b>3,475,423</b>
<b>Gross Margin</b>			
Per Fattened Cow	VND	<b>424,000</b>	<b>343,327</b>

**Table 20: Technical Results of Cattle Finishing Demonstrations from Lowland Communes**

Item	Unit	Projected Results (Gross Margins)	Tinh Tho Commune				Duc Phong Commune				Hanh Phuoc Commune				Pho Chau Commune				Average (All Demonstrations)
			HH 1		HH 2		HH1		HH 2		HH1		HH 2		HH 1		HH 2		
			Cow 1	Cow 2	Cow 1	Cow 2	Cow 1	Cow 2	Cow 1	Cow 2	Cow 1	Cow 2	Cow 1	Cow 2	Cow 1	Cow 2	Cow 1	Cow 2	
Purchase Liveweight	Kg	180	194	210	200	210	182	226	210	202	163	163	196	189	236	140	206	188	195
Purchase Price	VND/ Kg (LWt)	12,000	17,526	17,143	12,000	17,143	17,033	15,044	13,857	16,782	13,190	13,190	11,990	14,815	14,831	17,500	14,806	15,691	15,159
Duration of feeding	Days	60	68	68	68	68	60	60	75	75	66	66	63	63	84	84	70	70	69
Liveweight Gain	Kg	40	56	70	34	53	64	49	35	53	37	45	45	28	74	56	113	50	54
Cost of feed consumed per day	VND/ Day	7,000	5,329	5,830	3,368	6,138	7,428	8,513	6,933	8,427	6,685	6,685	7,856	7,740	8,140	6,479	9,714	7,883	7,072
Concentrate Used	Kg	220	191	209	124	226	219	251	260	316	247	247	272	268	375	297	365	295	260
Weight Gain per Day	Kg	0.67	0.82	1.03	0.50	0.78	1.07	0.82	0.47	0.71	0.56	0.68	0.71	0.44	0.88	0.67	1.61	0.71	0.78
Cost per Kg of Live Weight Gain	VND/ Kg of LWt Gain	10,500	6,471	5,664	6,735	7,875	6,964	10,424	14,857	11,925	11,924	9,804	10,998	17,414	9,241	9,718	6,018	11,036	9,817
FCE (Kg of Feed for 1 Kg of Live Weight Gain)	Kg	5.50	3.41	2.99	3.65	4.26	3.42	5.12	7.43	5.96	6.66	5.48	6.04	9.57	5.07	5.30	3.23	5.90	5.22
<b>Sale of Finished Animal</b>																			
Sale Liveweight (Live Weight)	Kg	220	250	280	234	263	246	275	245	255	200	208	241	217	310	196	319	238	249
Sale Price	VND/ Kg (LWt)	14,000	15,600	17,857	11,966	15,970	16,260	15,636	15,510	16,078	15,000	14,423	15,353	15,207	14,516	15,306	14,107	16,807	15,350
<b>Sale Price (VND)</b>		<b>3,080,000</b>	<b>3,900,000</b>	<b>5,000,000</b>	<b>2,800,000</b>	<b>4,200,000</b>	<b>4,000,000</b>	<b>4,300,000</b>	<b>3,800,000</b>	<b>4,100,000</b>	<b>3,000,000</b>	<b>3,000,000</b>	<b>3,700,000</b>	<b>3,300,000</b>	<b>4,500,000</b>	<b>3,000,000</b>	<b>4,500,000</b>	<b>4,000,000</b>	<b>3,818,750</b>
<b>Variable Costs</b>																			
Purchase of animal	VND	2,160,000	3,400,000	3,600,000	2,400,000	3,600,000	3,100,000	3,400,000	2,910,000	3,390,000	2,150,000	2,150,000	2,350,000	2,800,000	3,500,000	2,450,000	3,050,000	2,950,000	2,950,000
Cost of feed	VND	420,000	362,400	396,473	229,000	417,400	445,700	510,800	520,000	632,000	441,200	441,200	494,900	487,600	683,800	544,200	680,000	551,800	489,905
Medicines	Cow	76,000	25,000	55,000	55,000	25,000	26,000	26,000	67,000	26,800	55,100	25,200	29,400	29,300	44,500	38,000	21,000	20,000	35,519
<b>Total Variable costs</b>		<b>2,656,000</b>	<b>3,787,400</b>	<b>4,051,473</b>	<b>2,684,000</b>	<b>4,042,400</b>	<b>3,571,700</b>	<b>3,936,800</b>	<b>3,497,000</b>	<b>4,048,800</b>	<b>2,646,300</b>	<b>2,616,400</b>	<b>2,874,300</b>	<b>3,316,900</b>	<b>4,228,300</b>	<b>3,032,200</b>	<b>3,751,000</b>	<b>3,521,800</b>	<b>3,475,423</b>
<b>Gross Margin</b>																			
Per Fattened Cow	VND	424,000	112,600	948,527	116,000	157,600	428,300	363,200	303,000	51,200	353,700	383,600	825,700	-16,900	271,700	-32,200	749,000	478,200	343,327

## Pig Raising Demonstrations

**Table 21: Pigs Purchased for Pig Raising Demonstrations**

Commune	Pig 1			Pig 2		
	Purchase Weight (Kg)	Sex	Breed	Purchase Weight (Kg)	Sex	Breed
<b>Tịnh Thọ</b>						
HH 1	20	Male	F1	18	Female	F1
HH 2	17	Male	F1	20	Female	F1
<b>Đức Phong</b>						
HH 1	15	Female	F1	14	Female	F1
HH 2	16	Male	F1	15	Male	F1
<b>Sơn Hải</b>						
HH 1	7,5	Male	F1	13	Male	Mong Cai
HH 2	11	Female	F1	12	Male	Mong Cai
HH 3	12	Male	F1	12	Male	Mong Cai
HH 4	9,5	Female	F1	10	Male	Mong Cai
<b>Hành Phước</b>						
HH 1	13,5	Male	F1	13,5	Male	F1
HH 2	16	Male	F1	13	Male	F1
<b>Phổ Châu</b>						
HH 1	11,5	Female	F1	7,5	Female	F2
HH 2	11,5	Male	F1	8,5	Female	F2
<b>Nghĩa Thọ</b>						
HH 1	14	Female	F1	13	Male	F1
HH 2	11	Male	F1	9	Male	F1

**Table 22: Feed Rations Applied in Pig Raising Demonstrations**

Commune	HH and Pig Breed <sup>15</sup>	Feed Ration Applied	Proportion (%) of Feed for 10 - 30 Kg Pig						Proportion (%) of Feed for 30 - 60 Kg Pig						Proportion (%) of Feed for 60 - 90 Kg Pig						Demonstration Results			
			Cassava	Rice Bran	Maize	Fish Meal	Dry Soy	TA Dam Dac	Cassava	Rice Bran	Maize	Fish Meal	Dry Soy	TA Dam Dac	Cassava	Rice Bran	Maize	Fish Meal	Dry Soy	TA Dam Dac	Feed Consumed	FCE	Total Cost of Feed)	Cost per Kg
Hanh Phuoc	HH 2	1	55	15		30			55	25		20			55	30		15			502.3	3.6	1315700	2619
Son Hai	HH 1	1	55	15		30			55	25		20			55	30		15			170	3.4	474800	2793
Son Hai	HH 4	1	55	15		30			55	25		20			55	30		15			183.5	3.4	491600	2679
Son Hai	HH 2	1A	55	15		15		15	55	25		10		10	55	30		7.5		7.5	186	3.0	535000	2876
Son Hai	HH 3	1B	55	15				30	55	25				20	55	30				15	196.3	3.0	551800	2811
Son Hai	HH1 (Mong Cai)	1 (Local)	60	15		25			55	25		20			55	30		15			184	3.9	492300	2676
Son Hai	HH 4 (Mong Cai)	1 (Local)	60	15		25			55	25		20			55	30		15			170	3.8	455400	2679
Son Hai	HH 3(Mong Cai)	2 (Local)	60	15				25.0	55	25				20	55	30				15	171.2	4.0	481200	2811
Son Hai	HH 2 (Mong Cai)	2A (Local)	60	15		12.5		12.5	55	15		10		10	55	30		7.5		7.5	175.2	4.1	504000	2877
Nghia Tho	HH 1	2	55	15		15	15		55	25		10	10		55	30		7.5	7.5		364	3.1	941400	2586
Nghia Tho	HH 2	2	55	15		15	15		55	25		10	10		55	30		7.5	7.5		343.5	3.2	905800	2641
Tinh Tho	HH 1	3	30	15	30	25			25	30	25	20			30	25	30	15			430	3.0	1274200	2963
Duc Phong	HH 1	3	30	15	30	25			25	30	25	20			30	25	30	15			487.5	3.3	1478500	3034
Hanh Phuoc	HH 1	3	30	15	30	25			25	30	25	20			30	25	30	15			424	3.3	1182200	2788
Pho Chau	HH 1	3	30	15	30	25			25	30	25	20			30	25	30	15			192.7	3.7	585600	3039
Pho Chau	HH 1 (F2)	3	30	15	30	25			25	30	25	20			30	25	30	15			178.3	4.6	526600	2953
Pho Chau	HH 2	3	30	15	30	25			25	30	25	20			30	25	30	15			181.8	3.1	628000	3454
Pho Chau	HH 2 (F2)	3	30	15	30	25			25	30	25	20			30	25	30	15			217.6	4.8	512650	2356
Tinh Tho	HH 2	4	30	15	30	12.5	12.5		25	30	25	10	10		30	25	30	7.5	7.5		435.7	3.4	1229000	2821
Duc Phong	HH 2	5		20	60	20				35	50	15				40	50	10			484.5	3.6	1478100	3051

<sup>15</sup> F1 pig unless otherwise stated.

**Table 23: Comparison of Pig Raising Demonstration Results with Gross Margin Projections; Lowland Communes**

Item	Unit	Gross Margins			Tinh Tho				Duc Phong				Hanh Phuoc				Pho Chau				Average (All Demonstrations)
		Level of Technology			HH 1		HH 2		HH 1		HH 2		HH 1		HH 2		HH 1		HH 2		
		Low	Medium	High	Pig 1	Pig 2	Pig 1	Pig 2	Pig 1	Pig 2	Pig 1	Pig 2	Pig 1	Pig 2	Pig 1	Pig 2	Pig 1	Pig 2	Pig 1	Pig 2	
Breed of Pig		F1	F1 or F2	F2	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	F2	F1	F2	
Purchase Live weight	Kg	10	10	10	20	18	17	20	15	14	16	15	13.5	13.5	16	13	11.5	7.5	11.5	8.5	14.4
Sale Live weight	Kg	70	80	90	94	86	80.5	85	84	92	83	82.5	78	79	80	90	64	46	70	54	78
Live weight Gain	Kg	60	70	80	74	68	63.5	65	69	78	67	67.5	64.5	65.5	64	77	52.5	38.5	58.5	45.5	63.6
Days to Maturity	Days	180	165	150	105	105	105	105	130	130	106	106	106	106	124	124	140	140	140	140	119.5
Live weight Gain/day	Kg	0.33	0.42	0.53	0.70	0.65	0.60	0.62	0.53	0.60	0.63	0.64	0.61	0.62	0.52	0.62	0.38	0.28	0.42	0.33	0.55
Feed Consumed	Kg	228	245	256	215	215	217.8	217.9	235.5	252	242.5	242	212	212	229.1	273.2	192.7	178.3	181.8	217.6	220.9
Feed Conversion Efficiency	Ratio	3.8	3.5	3.2	2.9	3.2	3.4	3.4	3.4	3.2	3.6	3.6	3.3	3.2	3.6	3.5	3.7	4.6	3.1	4.8	3.5
Percent of Meat in Live Pig	%	40	45	50	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>Costs and Prices</b>																					
Purchase Price of Pig		200,000	220,000	250,000	320,000	300,000	300,000	320,000	260,000	260,000	250,000	250,000	260,000	260,000	230,000	260,000	207,000	150,000	207,000	170,000	250,250
Purchase Price per kg Live weight	VND	20,000	22,000	25,000	16,000	16,667	17,647	16,000	17,333	18,571	15,625	16,667	19,259	19,259	14,375	20,000	18,000	20,000	18,000	20,000	17,713
Total Feed Cost	VND	524,400	612,500	691,200	637,100	637,100	614,500	614,500	714,400	764,100	739,800	738,300	591,100	591,100	600,100	715,600	585,600	526,600	628,000	512,650	638,159
Feed Cost per kg	VND	2,300	2,500	2,700	2,963	2,963	2,821	2,820	3,034	3,032	3,051	3,051	2,788	2,788	2,619	2,619	3,039	2,953	3,454	2,356	2,897
Cost Per Kg of Weight Gain	VND/Kg	8,740	8,750	8,640	8,609	9,369	9,677	9,454	10,354	9,796	11,042	10,938	9,164	9,024	9,377	9,294	11,154	13,678	10,735	11,267	10,183
Cost of Veterinary Supplies/Pig	VND	15,000	20,000	30,000	20,000	40,000	30,000	30,000	130,000	70,000	25,000	25,000	25,200	25,200	21,400	21,300	38,500	42,200	40,200	47,700	39,481
<b>Gross Income</b>																					
Sale Price per kg Live weight	VND	11,000	12,000	13,000	8,000	8,000	6,708	8,000	9,000	9,000	8,000	8,000	9,000	9,000	8,500	8,500	10,000	10,000	9,500	9,500	8,669
Sale of Pig	VND	<b>770,000</b>	<b>960,000</b>	<b>1,170,000</b>	<b>752,000</b>	<b>688,000</b>	<b>540,000</b>	<b>680,000</b>	<b>756,000</b>	<b>828,000</b>	<b>664,000</b>	<b>660,000</b>	<b>702,000</b>	<b>711,000</b>	<b>680,000</b>	<b>765,000</b>	<b>640,000</b>	<b>460,000</b>	<b>665,000</b>	<b>513,000</b>	<b>669,000</b>
<b>Variable Costs</b>																					
Purchase of Piglet	VND	200,000	220,000	250,000	320,000	300,000	300,000	320,000	260,000	260,000	250,000	250,000	260,000	260,000	230,000	260,000	207,000	150,000	207,000	170,000	250,250
Feed	VND	524,400	612,500	691,200	637,100	637,100	614,500	614,500	714,400	764,100	739,800	738,300	591,100	591,100	600,100	715,600	585,600	526,600	628,000	512,650	638,159
Veterinary Supplies	VND	15,000	20,000	30,000	20,000	40,000	30,000	30,000	130,000	70,000	25,000	25,000	25,200	25,200	21,400	21,300	38,500	42,200	40,200	47,700	39,481
<b>Total Variable Costs</b>	<b>VND</b>	<b>739,400</b>	<b>852,500</b>	<b>971,200</b>	<b>977,100</b>	<b>977,100</b>	<b>944,500</b>	<b>964,500</b>	<b>1,104,400</b>	<b>1,094,100</b>	<b>1,014,800</b>	<b>1,013,300</b>	<b>876,300</b>	<b>876,300</b>	<b>851,500</b>	<b>996,900</b>	<b>831,100</b>	<b>718,800</b>	<b>875,200</b>	<b>730,350</b>	<b>927,891</b>
<b>Gross Margin per Pig</b>	<b>VND</b>	30,600	107,500	198,800	-225,100	-289,100	-404,500	-284,500	-348,400	-266,100	-350,800	-353,300	-174,300	-165,300	-171,500	-231,900	-191,100	-258,800	-210,200	-217,350	-258,891
<b>Gross Margin Percentage</b>	<b>%</b>	<b>4.0%</b>	<b>11.2%</b>	<b>17.0%</b>	<b>-29.9%</b>	<b>-42.0%</b>	<b>-74.9%</b>	<b>-41.8%</b>	<b>-46.1%</b>	<b>-32.1%</b>	<b>-52.8%</b>	<b>-53.5%</b>	<b>-24.8%</b>	<b>-23.2%</b>	<b>-25.2%</b>	<b>-30.3%</b>	<b>-29.9%</b>	<b>-56.3%</b>	<b>-31.6%</b>	<b>-42.4%</b>	<b>-38.7%</b>

**Table 24: Comparison of Pig Raising Demonstration Results with Gross Margin Projections; Upland Communes**

Item	Unit	Level of Technology			Nghia Tho				Son Hai								Average (All Demonstrations)
		Low	Medium	High	HH 1		HH 2		HH 1		HH 2		HH 3		HH 4		
					Pig 1	Pig 2	Pig 1	Pig 2	Pig 1	Pig 2	Pig 1	Pig 2	Pig 1	Pig 2	Pig 1	Pig 2	
Breed of Pig		F1	F1 or F2	F2	F1	F1	F1	F1	F1	Mong Cai	F1	Mong Cai	F1	Mong Cai	F1	Mong Cai	
Purchase Live weight	Kg	10	10	10	14	13	11	9	7.5	13	11	12	12	12	9.5	10	11.2
Sale Live weight	Kg	70	80	90	73	71	69	58	57	60	73	55	78	55	63	55	63.9
Live weight Gain	kg	60	70	80	59	58	58	49	49.5	47	62	43	66	43	53.5	45	52.8
Days to Maturity	days	180	165	150	105	105	105	105	107	107	107	107	107	107	107	107	106
Live weight Gain/day	Kg	0.33	0.42	0.53	0.56	0.55	0.55	0.47	0.46	0.44	0.58	0.40	0.62	0.40	0.50	0.42	0.50
Feed Consumed	kg	228	245	256	182	182	181.8	161.7	170	184	186	175.2	196.3	171.2	183.5	170	179
Feed Conversion Efficiency	Ratio	3.8	3.5	3.2	3.1	3.1	3.1	3.3	3.4	3.9	3.0	4.1	3.0	4.0	3.4	3.8	3.4
Percent of Meat in Live Pig	%	40	45	50	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>Costs and Prices</b>																	
Purchase Price of Pig		200,000	220,000	250,000	238,000	221,000	220,000	180,000	160,000	220,000	210,000	200,000	220,000	200,000	190,000	200,000	204,917
Purchase Price per kg Live weight	VND	20,000	22,000	25,000	17,000	17,000	20,000	20,000	21,333	16,923	19,091	16,667	18,333	16,667	20,000	20,000	18,584
Total Feed Cost	VND	524,400	612,500	691,200	470,700	470,700	468,000	437,800	474,800	492,300	535,000	504,000	551,800	481,200	491,600	455,400	486,108
Feed Cost per kg	VND	2	3	3	2,586	2,586	2,574	2,707	2,793	2,676	2,876	2,877	2,811	2,811	2,679	2,679	2,721
Cost Per Kg of Weight Gain	VND/Kg	8,740	8,750	8,640	7,978	8,116	8,069	8,935	9,592	10,474	8,629	11,721	8,361	11,191	9,189	10,120	9,364
Cost of Veterinary Supplies/Pig	VND	15,000	20,000	30,000	23,400	23,300	14,700	40,000	15,000	15,000	20,000	46,500	15,000	20,000	20,000	25,000	23,158
<b>Gross Income</b>																	
Sale Price per kg Live weight	VND	11,000	12,000	13,000	7,890	7,887	7,884	7,862	9,500	9,000	9,500	8,182	9,500	9,000	9,500	9,091	8,733
<b>Sale of Pig</b>	<b>VND</b>	<b>770,000</b>	<b>960,000</b>	<b>1,170,000</b>	<b>576,000</b>	<b>560,000</b>	<b>544,000</b>	<b>456,000</b>	<b>541,500</b>	<b>540,000</b>	<b>693,500</b>	<b>450,000</b>	<b>741,000</b>	<b>495,000</b>	<b>598,500</b>	<b>500,000</b>	<b>557,958</b>
<b>Variable Costs</b>																	
Purchase of Piglet	VND	200,000	220,000	250,000	238,000	221,000	220,000	180,000	160,000	220,000	210,000	200,000	220,000	200,000	190,000	200,000	204,917
Feed	VND	524,400	612,500	691,200	470,700	470,700	468,000	437,800	474,800	492,300	535,000	504,000	551,800	481,200	491,600	455,400	486,108
Veterinary Supplies	VND	15,000	20,000	30,000	23,400	23,300	14,700	40,000	15,000	15,000	20,000	46,500	15,000	20,000	20,000	25,000	23,158
<b>Total Variable Costs</b>	<b>VND</b>	<b>739,400</b>	<b>852,500</b>	<b>971,200</b>	<b>732,100</b>	<b>715,000</b>	<b>702,700</b>	<b>657,800</b>	<b>649,800</b>	<b>727,300</b>	<b>765,000</b>	<b>750,500</b>	<b>786,800</b>	<b>701,200</b>	<b>701,600</b>	<b>680,400</b>	<b>714,183</b>
<b>Gross Margin per Pig</b>	<b>VND</b>	<b>30,600</b>	<b>107,500</b>	<b>198,800</b>	<b>-156,100</b>	<b>-155,000</b>	<b>-158,700</b>	<b>-201,800</b>	<b>-108,300</b>	<b>-187,300</b>	<b>-71,500</b>	<b>-300,500</b>	<b>-45,800</b>	<b>-206,200</b>	<b>-103,100</b>	<b>-180,400</b>	<b>-156,225</b>
<b>Gross Margin Percentage</b>	<b>%</b>	<b>4.0%</b>	<b>11.2%</b>	<b>17.0%</b>	<b>-27.1%</b>	<b>-27.7%</b>	<b>-29.2%</b>	<b>-44.3%</b>	<b>-20.0%</b>	<b>-34.7%</b>	<b>-10.3%</b>	<b>-66.8%</b>	<b>-6.2%</b>	<b>-41.7%</b>	<b>-17.2%</b>	<b>-36.1%</b>	<b>-28.0%</b>

## Semi-Scavenging Chicken Raising Demonstrations

**Table 25: Chicken Breeds Raising in Semi-Scavenging Chicken Raising Demonstration**

Commune	Chick Age (days)	Breed	Purchase Source
Tinh Tho	01	Local chicken	In the Province
Duc Phong	01	Local chicken	In the Province
Hanh Phuoc	01	Local chicken	In the Province
Pho Chau	01	Yellow Chinese chicken	Outside provinces
Son Hai	15	Yellow Chinese chicken	Outside provinces
Nghia Tho	15	Yellow Chinese chicken	Outside provinces

**Table 26: Feed Rations Applied in Semi-Scavenging Chicken Raising Demonstrations**

Feed ration	Proportion (%)		
	Chickens from 0 – 30 days old	Chickens from 2 to 3 months old	Chickens from 4 to 6 months old
Industrial Concentrates	100	-	-
Feed concentrates		25	20
Corn or rice bran		53	26
Paddy grains		21	53
Premix mineral		1	1
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>

**Table 27: Cost of Chicken Feed in Semi-Scavenging Chicken Raising Demonstrations in RUDEP Communes**

Commune	Chickens from 0 to 30 days old	Chickens from 2 to 3 months old	Chickens from 4 to 6 months old
Tinh Tho	3,600	2,816	2,519
Duc Phong	3,600	2,765	2,588
Hanh Phuoc	3,600	2,645	2,746
Pho Chau	3,600	2,830	2,620
Son Hai	3,600	2,800	2,599
Nghia Tho	3,600	2,793	2,479

**Table 28: Levels of Mortality in Semi-Scavenging Chicken Raising Demonstrations**

Commune	Months of age						Total Chicken Deaths
	1	2	3	4	5	6	
Tinh Tho		1		2	5		8
Duc Phong	4	4	7	2	1	2	20
Hanh Phuoc	2						2
Pho Chau	3	1	3	3	1		11
Son Hai		1		2			3
Nghia Tho	4	4	2				10
<b>Total</b>	<b>13</b>	<b>11</b>	<b>12</b>	<b>9</b>	<b>7</b>	<b>2</b>	<b>54</b>

**Table 29: Total Number of Chickens upon the Completion of Semi-Scavenging Chicken Raising Demonstrations**

Commune	Total Number of Chickens	Cause of Death				Loss	Sold
		Total	Disease	Predator	Other		
Tinh Tho	85	11	8	2	1	10	64
Duc Phong	92	20	20	0	0	4	68
Hanh Phuoc	55	5	2	0	3	0	50
Pho Chau	53	12	11	0	1	0	41
Son Hai	23	11	3	6	2	0	12
Nghia Tho	22	10	10	0	0	0	12
<b>Total</b>	<b>330</b>	<b>69</b>	<b>54</b>	<b>8</b>	<b>7</b>	<b>14</b>	<b>247</b>

**Table 30: Technical Results of the Semi-Scavenging Chicken Demonstrations in Lowland Communes**

Item	Unit	Projected Results (Gross Margins)			Demonstration Results								Average (All Demonstrations)	
		Level of Technology			Tinh Tho		Duc Phong		Hanh Phuoc		Pho Chau			
		Low	Medium	High	HH 1	HH 2	HH 1	HH 2	HH 1	HH 2	HH 1	HH 2		
No. of Birds	Birds	50	50	50	50	50	50	50	50	50	50	50	50	50
No. of Bird Remaining	Birds	40	43	45	37	42	38	38	50	45	44	44	42	42
Mortality Rate	%	20	15	10	26%	16%	24%	24%	0%	10%	12%	12%	16%	16%
<b>Costs and Prices</b>														
Cost of Day-Old-Chicks	VND	3,000	3,000	3,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000
Sale Price per kg Lwt	VND	25,000	25,000	25,000	21,000	21,997	20,000	20,000	22,000	22,000	13,486	17,727	20,000	20,000
Total Feed Consumed (1-30 days)	Kg	35	35	35	35	35	35	35	35	35	35	35	35	35
Cost of Feed (1-30 days)	VND/Kg	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600
Total Feed Consumed (2-6 months)	Kg	420	420	420	428	428	409	406	484	429	637	573	474	474
Feed Cost per kg (2-6 months)	VND	2,500	2,600	2,700	2,623	2,623	2,652	2,655	2,672	2,734	2,640	2,706	2,663	2,663
Total Cost of Veterinary Supplies	VND	100,000	125,000	150,000	115,500	115,500	125,000	125,000	144,600	138,500	122,800	124,800	126,463	126,463
Cost of Veterinary Supplies/Bird	VND	2,000	2,500	3,000	2,310	2,310	2,500	2,500	2,892	2,770	2,456	2,496	2,529	2,529
Cost of 1 Kg Weight Gain per Bird	VND	14,700	14,329	14,000	18,739	15,639	15,914	17,684	16,629	16,758	23,474	18,183	17,878	17,878
FCE (Kg of Feed for 1 Kg of Weight Gain)	Kg Feed/1Kg of Wieght Gain	5.7	5.4	5.1	6.9	5.8	5.8	6.5	6.1	6.0	8.7	6.6	6.6	6.6
<b>Gross Income</b>														
No of Birds Sold	Birds	40	43	45	30	34	38	38	27	23	20	21	42	42
Total Weight of All Birds Sold	Kg	80	86	90	54	65	76	68	46	40	35	44	78	78
Average Weight of Birds	Kg	2	2	2	1.8	1.9	2.0	1.8	1.7	1.7	1.8	2.1	1.8	1.8
No. of Birds Retained by HH	Birds	N/A	N/A	N/A	7	8	0	0	23	22	24	23	N/A	N/A
Value of Birds Retained	VND	N/A	N/A	N/A	264,600	334,353	0	0	863,948	833,322	566,400	854,286	N/A	N/A
Sale of Birds	VND	2,000,000	2,150,000	2,250,000	1,134,000	1,421,000	1,520,000	1,360,000	1,014,200	871,200	472,000	780,000	1,559,433	1,559,433
<b>Total Value of Birds (Sold and Retained)</b>	<b>VND</b>	<b>2,000,000</b>	<b>2,150,000</b>	<b>2,250,000</b>	<b>1,398,600</b>	<b>1,755,353</b>	<b>1,520,000</b>	<b>1,360,000</b>	<b>1,878,148</b>	<b>1,704,522</b>	<b>1,038,400</b>	<b>1,634,286</b>	<b>1,536,164</b>	<b>1,536,164</b>
<b>Variable Costs</b>														
Purchase of 50 Day-Old-Chicks	VND	150,000	150,000	150,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000
Feed	VND	1,176,000	1,218,000	1,260,000	1,248,000	1,248,000	1,209,500	1,202,500	1,419,600	1,298,400	1,807,500	1,676,300	1,388,725	1,388,725
Veterinary Supplies	VND	100,000	125,000	150,000	115,500	115,500	125,000	125,000	144,600	138,500	122,800	124,800	126,463	126,463
<b>Total Variable Costs</b>	<b>VND</b>	<b>1,426,000</b>	<b>1,493,000</b>	<b>1,560,000</b>	<b>1,563,500</b>	<b>1,563,500</b>	<b>1,534,500</b>	<b>1,527,500</b>	<b>1,764,200</b>	<b>1,636,900</b>	<b>2,130,300</b>	<b>2,001,100</b>	<b>1,715,188</b>	<b>1,715,188</b>
<b>Gross Margin per 50 Chickens</b>	<b>VND</b>	<b>574,000</b>	<b>657,000</b>	<b>690,000</b>	<b>-164,900</b>	<b>191,853</b>	<b>-14,500</b>	<b>-167,500</b>	<b>113,948</b>	<b>67,622</b>	<b>-1,091,900</b>	<b>-366,814</b>	<b>-179,024</b>	<b>-179,024</b>
<b>Gross Margin Per Bird</b>	<b>%</b>	<b>14,350</b>	<b>15,459</b>	<b>15,333</b>	<b>-4,457</b>	<b>4,568</b>	<b>-382</b>	<b>-4,408</b>	<b>2,279</b>	<b>1,503</b>	<b>-24,816</b>	<b>-8,337</b>	<b>-4,237</b>	<b>-4,237</b>

**Table 31: Technical Results of the Semi-Scavenging Chicken Demonstrations in Upland Communes**

Item	Unit	Projected Results (Gross Margins)			Demonstration Results				Average (All Demonstrations)
		Level of Technology			Son Hai		Nghia Tho		
		Low	Medium	High	HH 1	HH 2	HH 1	HH 2	
No. of Birds	Birds	30	30	30	30	30	30	30	30
No. of Birds Remaining	Birds	24	26	27	25	24	25	25	25
Mortality Rate	%	20	15	10	17%	20%	17%	17%	18%
<b>Costs and Prices</b>									
Cost of 15-Day Old Chicks	VND	8,000	8,000	8,000	240,000	240,000	240,000	240,000	240,000
Sale Price per kg Lwt	VND	22,000	22,000	22,000	18,750	18,125	22,000	22,000	20,000
Total Feed Consumed (1-30 days)	Kg	15	15	15	15	15	15	15	15
Cost of Feed (1-30 days)	VND/Kg	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600
Total Feed Consumed (2-6 months)	Kg	265	265	265	251	251	270	270	260
Feed Cost per kg (2-6 months)	VND	2,500	2,600	2,700	2,727	2,727	2,677	2,655	2,697
Total Cost of Veterinary Supplies	VND	60,000	75,000	90,000	100,000	100,000	115,300	107,300	105,650
Cost of Veterinary Supplies/Bird	VND	2,000	2,500	3,000	3,333	3,333	3,843	3,577	3,522
Cost of 1 Kg Weight Gain per Bird	VND	14,927	14,569	14,250	14,750	15,365	11,932	12,410	13,614
FCE (Kg of Feed for 1 Kg of Weight Gain)	Kg Feed/1Kg of Weight Gain	5.8	5.5	5.2	5.3	5.5	4.4	4.6	4.9
<b>Gross Income</b>									
No of Birds Sold	Birds	24	26	27	4	8	4	8	25
Weight of Birds Sold	Kg	48	51	54	8	16	10	20	56
Average Weight of Birds	Kg	2	2	2	2.0	2.0	2.6	2.5	2.3
No. of Birds Kept by HH	Birds	N/A	N/A	N/A	21	16	21	17	N/A
Value of Birds Retained by HH	VND	N/A	N/A	N/A	787,500	580,000	1,201,200	935,000	N/A
Sale of Birds	VND	1,056,000	1,122,000	1,188,000	150,000	290,000	228,800	440,000	1,126,125
<b>Total Value of Birds (Sold and Retained)</b>	<b>VND</b>	<b>1,056,000</b>	<b>1,122,000</b>	<b>1,188,000</b>	<b>937,500</b>	<b>870,000</b>	<b>1,430,000</b>	<b>1,375,000</b>	<b>1,153,125</b>
<b>Variable Costs</b>									
Purchase of 50 Day-Old-Chicks	VND	240,000	240,000	240,000	240,000	240,000	240,000	240,000	240,000
Feed	VND	716,500	743,000	769,500	737,500	737,500	775,600	775,600	756,550
Veterinary Supplies	VND	60,000	75,000	90,000	100,000	100,000	115,300	107,300	105,650
<b>Total Variable Costs</b>	<b>VND</b>	<b>1,016,500</b>	<b>1,058,000</b>	<b>1,099,500</b>	<b>1,077,500</b>	<b>1,077,500</b>	<b>1,130,900</b>	<b>1,122,900</b>	<b>1,102,200</b>
<b>Gross Margin per 50 Chickens</b>	<b>VND</b>	<b>39,500</b>	<b>64,000</b>	<b>88,500</b>	<b>-140,000</b>	<b>-207,500</b>	<b>299,100</b>	<b>252,100</b>	<b>50,925</b>
<b>Gross Margin Per Bird</b>	<b>%</b>	<b>1,646</b>	<b>2,510</b>	<b>3,278</b>	<b>-5,600</b>	<b>-8,646</b>	<b>11,964</b>	<b>10,084</b>	<b>2,058</b>

## **Annex 4**

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# **Livestock Ad-Hoc Evaluation Forms**



## GAS Questionnaire

**Objective:** Demonstrate cattle growing techniques that reduce labour inputs

What is your perception of the labour required to adopt the demonstrated techniques?		
I think the demonstrated cattle growing techniques and needed very much less labour inputs than traditional methods		6.5
I think the demonstrated cattle growing techniques and needed less labour inputs than traditional methods		6.4
I think the demonstrated cattle growing techniques and needed about the same labour inputs as traditional methods		6.3
I think the cattle growing techniques but it required more labour inputs than traditional methods		6.2
I think the cattle growing techniques but it required much more labour inputs than traditional methods		6.1

Man

Woman

Date:

## Pig Raising Demonstration Ad-Hoc Evaluation Forms

### Structured Interview

1. Did you know that there was a pig growing demonstration conducted in XXXX village by the QNRDP? Yes <sub>1.1</sub> No <sub>1.2</sub>

2. (a) -Did you attend any demonstrations? Yes <sub>2.1</sub> No <sub>2.2</sub>

(b)-If yes, how many field days did you attend? ..... <sub>2.1.1</sub>

3. What was the demonstration trying to show?

Provide a net profit between VND30,000 to VND200,000 per pig in 4 to 5 months with low risk. <sub>3.1</sub>

Reduced risk due to disease control through vaccination. <sub>3.2</sub>

More rapid production of leaner pigs through the use of a high quality ration. <sub>3.3</sub>

Reduced labour input, especially for women. <sub>3.4</sub>

Other \_\_\_\_\_ <sub>3.5</sub>

Other \_\_\_\_\_ <sub>3.6</sub>

4. What do you plan to do in response to the demonstration?

Nothing <sub>4.1</sub>

Why:.....  
.....

Already adopted as demonstrated. <sub>4.2</sub>

Why:.....  
.....

Adopt soon as demonstrated. <sub>4.3</sub>

Already adopted modified version (\_\_\_\_\_). <sub>4.4</sub>

Adopt modified version soon (\_\_\_\_\_). <sub>4.5</sub>

Other \_\_\_\_\_ <sub>4.6</sub>

5. If not adopt, why ..... <sub>5.1</sub>

## GAS Questionnaire

**Objective:** Demonstrate pig growing techniques that reduce labour inputs

What is your perception of the labour required to adopt the demonstrated techniques?		
I think the demonstrated pig growing techniques and needed very much less labour inputs than traditional methods		6.5
I think the demonstrated pig growing techniques and needed less labour inputs than traditional methods		6.4
I think the demonstrated pig growing techniques and needed about the same labour inputs as traditional methods		6.3
I think the pig growing techniques but it required more labour inputs than traditional methods		6.2
I think the pig growing techniques but it required much more labour inputs than traditional methods		6.1

Man

Woman

Date:

## Semi-Scavenging Chicken Raising Demonstration Ad-Hoc Evaluation Forms

### Structured Interview

1. Did you know that there was a chicken growing demonstration conducted in .....  
village by the RUDEP ? Yes <sub>1.1</sub> No <sub>1.2</sub>

2. (a) - Did you attend any demonstrations?  
Yes <sub>2.1</sub> No <sub>2.2</sub>

(b) - If yes, how many field day did you attend? ..... <sub>2.1.1</sub>

3. What was the demonstration trying to show?

Provide a net profit between VND 300,000-VND 800,000/50 chickens in 6 months

with low risk <sub>3.1</sub>

Disease control <sub>3.2</sub>

Method of raising is keeping chickens in <sub>3.3</sub>

More production of chickens through the use of supplemental food <sub>3.4</sub>

Other \_\_\_\_\_ <sub>3.5</sub>

Other \_\_\_\_\_  
<sub>3.6</sub>

4. What do you plan to do in response to the demonstration?

Nothing <sub>4.1</sub>

Why:.....  
.....

Already adopted as demonstrated. <sub>4.2</sub>

-Why:.....

Adopt soon as demonstrated. <sub>4.3</sub>

Already adopted modified version (\_\_\_\_\_). <sub>4.4</sub>

Adopt modified version soon (\_\_\_\_\_). <sub>4.5</sub>

Other \_\_\_\_\_ <sub>4.6</sub>

5. If not adopt, why ..... <sub>5.1</sub>

## GAS Questionnaire

**Objective:** Demonstrate chicken growing techniques that reduce labour inputs

What is your perception of the labour required to adopt the demonstrated techniques?		
I think the demonstrated chicken growing techniques and needed very much less labour inputs than traditional methods		6.5
I think the demonstrated chicken growing techniques and needed less labour inputs than traditional methods		6.4
I think the demonstrated chicken growing techniques and needed about the same labour inputs as traditional methods		6.3
I think the chicken growing techniques but it required more labour inputs than traditional methods		6.2
I think the chicken growing techniques but it required much more labour inputs than traditional methods		6.1

Date:

Man

Woman

## **Annex 5**

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# **Discussion Tables from the Livestock Demonstration Review Workshop**

## Annex 5: Discussion Tables from the Livestock Demonstration Review Workshop

**Table 32: Review of Cattle Finishing, Pig Raising and Chicken Raising Demonstrations in Hanh Phuoc, Tinh Tho, Duc Phong and Pho Chau Communes**

Comments on Current Demonstrations		Livestock Variety		
		Cattle	Pigs	Chickens
<b>Demonstration Model</b>	What was Good and Why?	Good and efficient technologies Profitable model Good forage planting models	Good and efficient raising techniques Appropriate activity for women Households worked hard to implement	Good technical guidance and training Efficient vet services Sufficient feed supplies Chickens were sold with a profit Farmers like the model Few chickens died during the demonstration
	Training methods were easy to understand			
	What Needs to Change and Why?	Bull finishing is better than cow finishing because bulls grow faster Cross-breed cattle should be used	Technical materials are needed Larger-framed pigs should be introduced Pen hygiene needs to be improved (e.g. drinking water) More pigs should be raised	Raising period should be reduced (to 4-5 months) Incubation machine needed for local chick production Technical materials are needed Better breeds; the meat quality is low
	Paravets should provide more support to farmers Use locally available feeds when possible			
<b>Demonstration Format</b>	What was Good and Why?	Good technical guidance that is easy to understand		Learned technologies in detail
	What Needs to Change and Why?	Need both theoretical and practical guidance Want to learn cattle breeding technologies	Need both theoretical and practical guidance Training schedule should be made that is convenient for local people	Training schedule needs to be more convenient for local people

Comments on Current Demonstrations		Livestock Variety		
		Cattle	Pigs	Chickens
		Farmers should be trained on selecting good breeds Information on animal health technologies at field days should be improved More visual training tools and materials should be used No working on Saturdays and Sundays Demonstration farmers should receive training prior to implementing the demonstration		
<b>Supply of Equipment and Feeds</b>	What Needs to Change, Why and How?	RUDEP should support households to purchase feed directly in the future Some of the feed is not available in local areas Give demonstration farmers more responsibility to purchase feeds		
<b>Marketing Support</b>	What Problems Arose and What Needs to Change?	More buyers should be introduced to locations		Chicken breeds promoted in the demonstration are not available locally Good chicken breeds are needed Technical officers were not available on time to buy inputs
		RUDEP should provide good quality breeds and find selling markets for farmers More marketing support is required The sale price of some livestock fell sharply reducing the profitability of some models Feed needs to be purchased from different locations to reduce prices		
<b>On-Going Technical Support</b>	What Format Should it Take and Why is it Needed?	Further cattle finishing support	Sow raising technologies with technical materials	The number of field days should be increased (2 more) Incubation technologies are needed to increase chick supply
		CPC should have one technical officer to assist households on animal health issues Animal health training for households should be expanded Theories should be explained so that they are easier to understand		

Comments on Current Demonstrations		Livestock Variety		
		Cattle	Pigs	Chickens
Other Issues	Specific	Farmers did not attend all field days and did not learn the technologies well Cattle breeding technologies need to be introduced	Use F1 and F2 breeds F2 breeds are better than F1 Pig breeding models need to be incorporated	Should develop an integrated model with chickens, ducks, aquaculture and pigs
	General	<p>Regulations should be introduced to make sure that farmers attend all field days</p> <p>Demonstration farmers should be selected that have knowledge, good conditions; there is no need to focus on poor households</p> <p>Poor households have little knowledge and lack communication skills</p> <p>Animal Health Committee should be formed in the Commune with training support</p> <p>Activity Groups should be strengthened and VSCFs should start soon</p>		

**Table 33: Review of Cattle Finishing, Pig Raising and Chicken Raising Demonstrations in Nghia Tho and Son Hai Communes**

Comments on Current Demonstrations		Livestock Variety		
		Cattle	Pigs	Chickens
<b>Demonstration Model</b>	What was Good and Why?	Appropriate for rich households Appropriate models	Households do not have to cook feed for pigs (low labour requirements) 90% of households understood pig raising technologies	Good chicken breeds
	What Needs to Change and Why?	Cattle breeds were not good quality Need to change to Laisin cattle breeds	F1 pig raising should be promoted Pig breeding should be incorporated into demonstration activities	More field days are needed
		Technical material is too difficult for households to understand Training material should be provided in the H're language		
<b>Demonstration Format</b>	What was Good and Why?		Low labour requirements	Low labour requirements
		Content of the technical material was prepared well		
	What Needs to Change and Why?		More time for practicing and learning	More time for practicing and learning
		Further technical training is needed Training needs to include visual materials and pictures to make it easier for households to understand More time is needed for training and practicing More equipment support is needed		
<b>Supply of Equipment and Feeds</b>	What was Good and Why?		Supply of feed was timely	Supply of feed was timely
		Good and timely delivery of feed to households Sufficient provision of equipment for the demonstrations		
	What Needs to Change, Why and How?	Some of the feed is not available in local areas		

Comments on Current Demonstrations		Livestock Variety		
		Cattle	Pigs	Chickens
<b>Marketing Support</b>	What Problems Arose and What Needs to Change?		Farmers need assistance on the purchase of piglets and the sale of finished pigs	Farmers need assistance on places to buy chicks and the sale of finished birds
		Marketing information (purchase of inputs and the sale of finished livestock) need to be given to all households – not only the demonstration farmer  Activity Group members should visit a range of places where breeds can be purchased and finished livestock can be sold  More study tours should be arranged		
<b>On-Going Technical Support</b>	What Format Should it Take and Why is it Needed?		Further training on technologies promoted	Technologies to incubate chickens is recommended  Further training on the technologies promoted
		Further training days and activities should be undertaken Training should be provided with visual learning aids		
<b>Other Issues</b>	General	There is no Commune paravets currently work in Nghia Tho; therefore animal health training is recommended to deliver to households  Milling machines for livestock production support		

**Table 34: Suggested Format of Future Livestock Demonstration Activities in Hanh Phuoc, Tinh Tho, Duc Phong and Pho Chau Communes**

Suggestions for Future Demonstration Activities		Livestock Variety		
		Cattle	Pigs	Chickens
<b>Demonstration Models</b>	What Demonstration Models are Suggested?	Cattle breeding Fatten healthier cattle rather than skinny cattle Cross-bred cattle raising	Should be semi-industrial models Locally available feeds should be used Pig breeding models	Model should be expanded in combination with duck and pig raising Introduction of chicken incubation technologies needed Earthworm raising for chicken feed should be included
		Goat raising Rice-fish aquaculture and fresh water fish culture Fruit trees Muscovite duck raising		
	What Needs to Change?		Correct demonstration households should be selected Insemination services need to be developed in upland Communes	
		Models and technologies should be communicated to more households in the Communes More attention to using locally available feeds is needed More attention given to choosing households that are not poor is needed Increase of initial input funding Activity Groups in upland Communes should be given scales to use after the demonstrations		
<b>Demonstration Feasibility</b>	What was Requested?	Forage/fodder should be prepared before the demonstration More appropriate cattle breeds		Raising period should be reduced
		Number of field days should be increased (1-2 more field days) Feed should be purchased locally and appropriate to poor households		

Suggestions for Future Demonstration Activities		Livestock Variety		
		Cattle	Pigs	Chickens
	Are these Feasible?	Less emphasis on soy bean and fish meal for protein		
		Sufficient numbers of technical staff exist Households have sufficient available labour Cost of 1 Kg of weight gain will reduce		
<b>Changes to Current Demonstration Format</b>	What Needs to Change and How?	Purchasing skinny cattle is difficult and support is needed	Places for selling high quality pig breeds should be introduced	Places for selling chickens should be introduced
<b>Further Training Activities</b>	Households	Animal health training for households		
	General	Paravet training		

**Table 35: Roles and Responsibilities for Implementing Futures Demonstrations Activities in RUDEP Communes**

<b>Roles and Responsibilities for Implementing Future Demonstrations</b>	<b>Households and Activity Groups</b>	<b>CPCs</b>	<b>District Extension Centres</b>	<b>Provincial Extension Centres</b>
<b>Roles and Responsibilities</b>	<p>Must actively participate in the demonstrations and training</p> <p>Adopt models and communicate knowledge learned</p> <p>Select demonstration households and support members in the Activity Groups</p> <p>Encourage the participation of neighbouring households</p> <p>Households should be enthusiastic and regularly monitor the models</p> <p>Understand marketing and animal health technologies and communicate these to other households</p> <p>Report any problems to the CCG and other authorities</p>	<p>Support the participation of households</p> <p>Inform households of dates to participate in activities</p> <p>Attend field days with households</p> <p>Organise meeting events</p> <p>Implement projects in accordance with State regulations</p> <p>Implement activities in accordance with schedules</p>	<p>Liaise with RUDEP staff to provide activities suitable for households</p> <p>Encourage the households in the Commune to adopt activities</p> <p>Select Activity Group members properly</p> <p>Support the demonstrations within their technical capacity</p> <p>Assist with coordinating activities</p>	<p>Provide households with practical activities to assist them to generate income</p> <p>Implement activities that are realistic for households</p> <p>Learn appropriate models outside the Province and implement these in Quang Ngai</p> <p>Inform all activities to the Commune prior to implementing activities</p> <p>Supervise the implementation of demonstrations</p> <p>Provide technical support to District Extension Stations</p>

### **Limitations**

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