

Identifying barriers to entry to livestock input and output markets in South-East Asia: The case of Vietnam

Socio-economics and Policy Research



**Food and Agriculture Organization
of the United Nations**

ILRI

INTERNATIONAL
LIVESTOCK RESEARCH
INSTITUTE

International Livestock Research Institute

Identifying barriers to entry to livestock input and output markets in South-East Asia: The case of Vietnam

Socio-economics and Policy Research Working Paper 56

Ma.L. Lapar, Vu Trong Binh and S. Ehui



Food and Agriculture Organization of the United Nations
via delle Terme di Caracalla, 00100 Rome, Italy

ILRI

INTERNATIONAL
LIVESTOCK RESEARCH
INSTITUTE

International Livestock Research Institute
P.O. Box 30709, Nairobi, Kenya

Working Papers Editorial Committee

Samuel E. Benin (Editor)
Berhanu Gebremedhin
Steven J. Staal

SePR Working Papers contain results of research done by ILRI scientists, consultants and collaborators. The Working Papers are not subjected to full refereeing and are disseminated to motivate discussion and comment. It is expected that most of the Working Papers will be published in some other form. The author(s) alone is (are) responsible for the contents.

This document is also published as a Food and Agriculture Organization of the United Nations (FAO) Sector Analysis and Policy Branch (AGAL) document

Authors' affiliations

Ma. Lucila Lapar, International Livestock Research Institute (ILRI), DAPO Box 7777,
Metro Manila, The Philippines
Vu Trong Binh, Vietnam Agricultural Science Institute (VASI), Agrarian Systems
Department, Thanh Tri, Hanoi, Vietnam
Simeon Ehui, ILRI, P.O. Box 5689, Addis Ababa, Ethiopia

2003 ILRI (International Livestock Research Institute)

All rights reserved. Parts of this publication may be reproduced for non-commercial use provided that such reproduction shall be subject to acknowledgment of ILRI as holder of copyright.

ISBN 92–9146–153–9

Correct citation: Lapar Ma.L., Vu Trong Binh and Ehui S. 2003. Identifying barriers to entry to livestock input and output markets in South-East Asia: The case of Vietnam. Socio- economics and Policy Research Working Paper 56. ILRI (International Livestock Research Institute), Nairobi, Kenya. 58 pp.

Table of Contents

List of Tables	v
List of Figures	vi
Acknowledgements	vii
Executive summary	1
1 Introduction.	3
2 Livestock policy environment	4
3 Structure of the industry and changes over the past two decades	6
3.1 National herds	7
3.1.1 Pigs.	8
3.1.2 Poultry	9
3.2 Number of households keeping livestock	10
3.3 Composition of the industry	11
3.3.1 Pig industry	11
3.3.2 Poultry industry	12
3.3.3 Poultry meat production	15
3.4 Contribution to the household income	15
3.5 Structures of livestock production.	18
3.6 Economics of production	20
3.7 Marketing channels	21
3.7.1 Commodity flow for pigs	24
3.8 Marketing margins	30
3.9 Trade flow patterns	31
3.9.1 Domestic trade.	31
3.9.2 Opportunities for export	32
4 Constraints to output/input markets.	34
4.1 Factors affecting market participation: Output markets	34
4.1.1 Meat quality and safety	34
4.1.2 Legal framework and standards	35
4.1.3 Bottlenecks in the distribution channel.	35
4.1.4 Limited access to information	36
4.2 Factors affecting market participation: Input markets	37
4.2.1 Quality and price of animal feed	37
4.2.2 Quality and price of animal breeds	37
4.2.3 Livestock services and inputs	38
4.2.4 Transaction costs.	38
5 Role of policy in addressing constraints.	40
6 Examples of interventions that address barriers to markets	42
7 Potential areas for research and development	45

8 Summary and conclusion.	48
References	49

List of Tables

Table 1.	Growth rates of the live weight of various domestic animals, Vietnam, 1990–99	7
Table 2.	Livestock productivity and growth rate in productivity ratio by type of domestic animal, Vietnam, 1990–99.	8
Table 3.	Share of gross income from livestock to total agricultural income, 1999.	15
Table 4.	Type of pig sold per households in Red River Delta	16
Table 5.	Percentages of average income of households in Quoc Tuan, Hai Duong, Vietnam	18
Table 6.	Percentages of average income of households in Thai Tan commune, Hai Duong, Vietnam	18
Table 7.	Estimated coefficients of return to scale equation	21
Table 8.	Economics of smallholder pig production, Vietnam	22
Table 9.	Economics of smallholder poultry production, Vietnam.	23
Table 10.	Scheme with estimates of cost distribution.	23
Table 11.	Average marketer costs and margin levels by marketer type across species (VND 10 ³).	31
Table 12.	Average margins by specialisation and marketer type (VND 10 ³)	31
Table 13.	Variations in the price of pork from production to consumption, comparing the same pig genotype (F ₁ Domestic Foreign)	39

List of Figures

Figure 1. Gross value of agricultural output, Vietnam, 1990–2000.	6
Figure 2. Pig production by region, Vietnam, 1985–2000.	9
Figure 3. Poultry production by region, Vietnam, 1995–99.	10
Figure 4. Egg production by region, Vietnam, 1995–99	11
Figure 5. Slaughter cattle marketing channels (numbers represent percentage of sales through channel).	24
Figure 6. Slaughter pig marketing channels (numbers represent percentage of sales through channel).	25
Figure 7. Slaughter chicken marketing channels (numbers represent percentage of sales through channel).	26
Figure 8. Product flow of pigs in Ho Chi Minh City	28
Figure 9. Farm-gate price of live pig in Red River Delta and some countries around the world, 1990–99.	33

Acknowledgements

We would like to acknowledge Prof Dao The Tuan, Mr Dao The Anh, Ms Bui Thi Thai and Ms Pham Thi Hanh Tho from the Agrarian Systems Department of Vietnam Agricultural Science Institute (VASI) for their valuable contribution to the write-up of this country report. We are also grateful to Ms Tran Kim Anh of the Department of Forestry and Agricultural Extension of the Ministry of Agriculture and Rural Development (MARD) for facilitating access to information about the government's programmes and policies in the livestock sector; and to Dr Jens Peter Tang Dalsgaard of the Danish International Development Agency–Agriculture Sector Programme Support (DANIDA— ASPS) Small Livestock Component Project for sharing relevant information about the ASPS project. We are indebted to Dr Nguyen Duy Can from Mekong Delta Farming Systems Research and Development Institute of University of Can Tho for sharing valuable insights and information about the livestock sector in the Mekong; to Mr Dominic Smith of Agri-Food Consulting for the copies of policy briefs; and to Prof Dr Le Viet Ly for his untiring support for livestock research in Vietnam. We would like to express our gratitude to Ms Catherine Aragon of the International Livestock Research Institute (ILRI) for her excellent research assistance; and Dr Douglas Gray for his generosity and support of this undertaking in his capacity as team leader and regional representative of ILRI in South-East Asia. We would also like to thank Drs Joachim Otte and Nancy Morgan of the Food and Agriculture Organization of the United Nations– Sector Analysis and Policy Branch (FAO–AGAL) for their constructive comments and suggestions that have enhanced the discussions in the report.

This study is part of a four-country research, viz. Indonesia, The Philippines, Thailand and Vietnam, on barriers to market access partially funded by the Pro-poor Livestock Policy Facility of FAO that is being supported by a grant from the Department for International Development (DFID) of the United Kingdom (UK).

Executive summary

Livestock account for about 23% of the agricultural gross domestic product (GDP) in Vietnam. The sector also provides at least 50% of cash income to smallholder households. Pigs and poultry are the most widely raised species, particularly in rural areas, where pork and poultry meat account for about 77 and 16% of meat production, respectively, while the rest is comprised of beef and other types of meat. In addition, livestock provide high quality protein to millions of smallholders, thus enhancing their nutrition.

Over the last decade, the livestock sector in Vietnam has made significant progress towards the development of a domestic market for meat, as well as some inroads into the export market. However, there has been increasing concern about meat quality and safety in both the domestic and export markets, which creates new challenges for the key players in the livestock sector. The Vietnamese Government recognises that the sector's competitiveness in the emerging political and economic environment requires efforts to improve productivity through modernisation, and enhance product value and quality through regulations and a comprehensive investment strategy. This augurs well for the development of the sector and could pave the way for increased participation by small-holder livestock producers in the development process as long as the appropriate policies and institutions are in place.

This study provides a comprehensive review of the development of the livestock sector during the last decade and identifies barriers to livestock input and output markets for smallholder livestock producers. Potential issues for research and development that can be addressed through policy and institutional reforms are also identified. This report focuses on the pig and poultry sector. Both sectors, particularly the pig sector, have been growing rapidly and are on the verge of structural transformation, in response to both internal and external forces, i.e. the expanding domestic demand and the opportunities for export.

Barriers to livestock input markets include the uncertain quality and high prices of animal feeds including raw materials for feed processing, the variable quality and high cost of more productive animal breeds, and the inefficient delivery of veterinary services and high cost of veterinary inputs. The development of output markets, on the other hand, is constrained by the poor quality and safety of meat, unsatisfactory legal frameworks and standards, bottlenecks in the distribution channels and limited access to information. In addition, the prevailing marketing system and channels from farm to market for each type of commodity has evolved into a multi-layer system that is characterised by high transaction costs and a lack of integration among the actors in the various channels. In Vietnam, the absence of an organised marketing system for livestock and the lack of some basis for comparison discourage producers to improve productivity. It also worsens the low bargaining power of producers relative to traders and wholesalers.

It is envisioned that the government could play a regulatory role in ensuring that standards and regulations to produce high quality, safe meat and meat products will be

enforced and sustained. Moreover, research into the development of alternative production models that are suitable to smallholder producers while at the same time capable of generating high quality and safe meat and meat products would be important in encouraging more smallholder participation in the emerging markets for livestock. Collective action to take advantage of economies of scale in input procurement as well as output marketing could potentially be developed and tested for replication on a wider scale. Government support for these initiatives would certainly be welcome.

1 Introduction

From the early 1980s to the late 1990s, meat consumption in South-East Asia has grown between 4 and 8% per year (Delgado et al. 1999). This increase was fuelled by rapid growth in income (4–8%), population growth (2–3%) and urbanisation (4–6%). The increasing demand for livestock products in the region, which is expected to continue well into the future, presents expanding market opportunities for livestock producers in the region. However, the terms under which the poor livestock producers enter these livestock input and output markets are often inequitable because of the presence of high transaction costs (including physical and institutional barriers). Transaction costs can be defined as the pecuniary and non-pecuniary costs associated with arranging and carrying out the exchange of goods and services. The liberalisation of domestic markets and the globalisation of international trading regimes have made livestock markets more open but at the same time more complex and risky for poor smallholder livestock producers.

The inability of farmers to sell their livestock products or to buy livestock input and services reduces their income and access to cash and prevents asset accumulation. Therefore, fostering the ability of poor livestock producers to enter markets and actively engage in them is a pressing development challenge. Removing or reducing the barriers to market access and facilitating market participation for poor livestock producers can contribute to poverty alleviation. A recent International Livestock Research Institute– Food and Agriculture Organization of the United Nations–Japan Livestock Technology Agency–Department of Livestock Development of Thailand (ILRI–FAO– JLTA–DLD) workshop also recognised market access problems as key constraints to raise poor households’ levels of livelihood assets in the form of capital, improved nutrition, better education and access to health infrastructure (Frio and Gray 2002). Among the participants in the workshop were representatives of Cambodia, China, Indonesia, Japan, Lao PDR, Malaysia, Myanmar, The Philippines, Thailand and Vietnam. ILRI, FAO and the International Center for Tropical Agriculture (CIAT) were among the participating international research and development organisations. In the light of the findings of the workshop and the perceived need to obtain more information on barriers to market entry, FAO commissioned ILRI to undertake a study on barriers to market entry by smallholder livestock producers.

This report is organised as follows: Section 2 describes the existing livestock policy environment. Section 3 discusses the structure of the industry and its changes over time. Section 4 identifies the barriers to livestock input and output markets while Section 5 focuses on the role for policy interventions in addressing the constraints. Section 6 cites some examples of successful interventions to address the barriers to markets. Section 7 identifies some potential areas for research and development and Section 8 provides a summary and conclusion.

2 Livestock policy environment

In the last decades of the 20th century, Vietnam progressed from a nation of chronic food shortages to one of the world's leading exporters of agricultural products including rice, coffee, rubber and tea. This economic growth, marked by a doubling of gross domestic product (GDP) was largely made possible by the doi moi reforms of the 1980s. Doi moi consisted of two successive reforms: the allocation of the factors of production (especially land) to individual households, followed by economic liberalisation and the opening of the country to external markets (Castella and Quang 2002).

The remarkable economic growth that resulted from these reforms was based largely on the rural households, which had become the new unit of agricultural production. The technical, economic and social changes that accompanied the transition transformed agricultural production, resource management, land use and the institutions that defined resource access and distribution. However, the impact of the changes varied widely across regions. In particular, agricultural growth in the past decade has benefited the delta regions far more than the remote mountainous areas (Kerkvliet and Porter 1995; Poverty Task Force 1999; Minot and Baulch 2002). Of further interest are the different impacts of these changes across and within sectors in the economy. On the latter, a comprehensive study was undertaken on the rice sector analysing the policy issues and impacts of the reforms, specifically the liberalisation of the rice markets (Minot and Goletti 2000). The study indicates that market reforms have had a positive effect on economic growth and agricultural production. Furthermore, survey data reveals that rural incomes have risen because of the reforms.

In spite of these gains, rural poverty rates in Vietnam are still too high (about 93 to 95%), and the benefits of liberalisation have probably not been distributed equally among regions and between urban and rural areas.

Unlike the rice and other sectors, there is no specific government policy in place for the livestock sector. The Government of Vietnam has prepared a draft rural development strategy in 1998, which will form the basis for future consultations between the government, the donor community and other stakeholders. The strategy intends to cover key issues concerning rural development and to cast some light on the government's vision for rural development. The major tasks ahead are described as:

- increasing agricultural productivity and farm incomes
- stimulating employment in non-farm rural activities
- managing natural resources and conserving important ecosystems and
- targeting persistent poverty in the uplands.

The livestock sector has a key role in rural income diversification. Existing livestock policy, however, focuses solely on the level of production and consumption. With the opportunities the sector offers for wider rural development, this is a major omission. A clear policy, which contributes to broad-based growth, poverty alleviation and the creation of an environment conducive to active private sector participation will be the

foundation on which specific livestock sector development activities will make the best contribution.

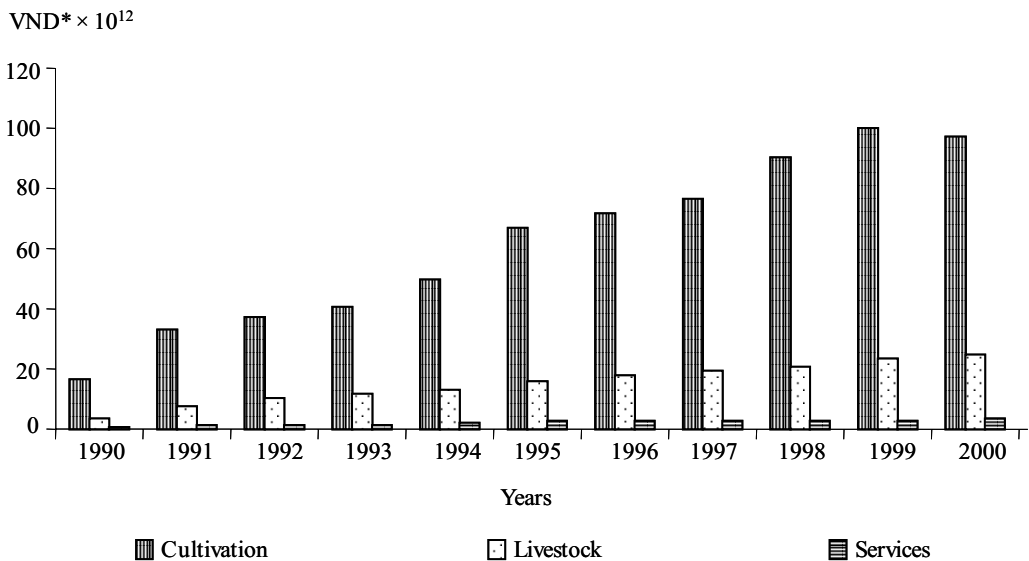
The current 'implicit' policy is reflected in the government's public expenditure priorities that do not favour the under-resourced and weak support services for small farmers. The infrastructure for the provision of services is extremely weak, a situation exacerbated by the fact that the officers in place have little information and skills to pass on.

Despite this, some of the important changes in policies for other agricultural sectors contributed significantly to livestock development. The implementation of resolution N10 in 1998 was a significant step in promoting individual households as independent economic units of production and marketing of their products. This resulted in important changes that facilitated positive developments in animal and crop production. These changes were apparently facilitated by the Vietnamese Government's new policy to promote small livestock farming among smallholder farmers, with pigs and poultry being two of the more important species that currently get support through various government and/or donor-supported programmes.

In 2002, the Vietnamese Government launched a nationwide programme on 'Hunger alleviation and poverty reduction' to support resource-poor farmers and improve the living conditions of rural people. The programme involves the provision of low-interest credit to poor farmers, specifically for the purchase of piglets, beef cattle and dairy cows. This programme has encouraged more farmers to engage in crop-livestock production.

3 Structure of the industry and changes over the past two decades

During the past ten years, the value of agricultural sector products increased six-fold (Vu Trong Binh et al. 2002), while the value of livestock sector products increased 6.7 times. The data shows that the livestock sector is growing faster than agriculture in general. In 1990, the livestock sector accounted for about 18% of the total value of agriculture, increasing to about 20% in 2000 (Figure 1). This indicates that a shift in the production structure of agriculture is taking place. For the past five years, the livestock sector has been growing at a rate of about 6–7% annually. Generally, the development in the livestock sector during the 1990s is faster than from 1954 to 1990. This was fuelled by the implementation of specific laws and reforms that had positive impacts on the livestock sector.



* In 2002, US\$ 1 = Vietnamese dong (VND) 15,325.

Figure 1. Gross value of agricultural output, Vietnam, 1990–2000.

Livestock are predominantly raised in small-scale household production units. At present, smallholder producers supply the majority of meat in the market, with most of the households operating individually in the production and marketing of livestock and livestock products. To a limited extent, collective action mechanisms to produce and sell livestock and livestock products are currently in place in Vietnam. There are also a number of large-scale farms producing thousands of pigs per year. These farms are mainly concentrated in the south-eastern region and some are beginning to flourish in the Red River Delta and are operated by relatively well-off farmers.

According to Vu Trong Binh et al. (2002), food-processing factories for livestock products did not exist in Vietnam before 1960. The building of food-processing factories started with the importation of exotic pig breeds into Vietnam. During the 1960s and 1970s, many food processing factories and plants were built, but after the economic reforms of the 1980s they were closed down again because they ceased to be profitable due to bad performance and poor adaptability to prevailing market conditions. In the 1990s, many new food-processing factories were set up. According to the Vietnamese Ministry of Agriculture and Rural Development (MARD), at the end of 1999 there were 105 food-processing factories for livestock products with an annual output of about 2.8 million tonnes. Among the 105 companies, 62% were privately owned, 22% were government-owned, 12% were foreign-owned or joint ventures and 4% were co-operatives. The majority of these companies have low output levels, 45% have outputs of less than 5000 t/year, whereas only about 10% have outputs of more than 50 thousand tonnes/year.

3.1 National herds

Livestock production has developed rapidly but in varying degrees for different livestock species. In recent years, the number of pig and cattle increased rapidly, but the number of buffaloes increased only a little. In the Red River Delta, the number of buffaloes has even been decreasing. The poultry industry developed rapidly between 1995 and 2000, with productivity increasing by a factor of 1.3. Table 1 shows that between 1990 and 1999, the average live weight of pig and poultry was growing annually at a fast rate of about 7 and 6.3%, respectively. Although the live weight of cattle has also been increasing rapidly (at a rate of about 5.5% per year) during the same period, it should be noted that the larger part of this increase took place between 1995 and 1999 (at a rate of about 7.4% per year). On the contrary, the annual growth rate in the live weight of buffaloes was higher between 1990 and 1995 (about 4.7%) than in the period from 1995 to 1999 (about 2.7%).

Table 1. Growth rates of the live weight of various domestic animals, Vietnam, 1990–99.

Species	Live weight ($\times 10^3$ t) 1999	Increase (%)		
		1990–95	1995–99	1990–99
Pig	1318.2	6.96	6.97	6.96
Poultry	261.8	5.35	7.44	6.28
Chicken	198.2	5.71	7.33	6.43
Duck	63.6	5.08	7.87	6.32
Cattle	85.5	3.95	7.41	5.49
Buffalo	46.2	4.69	2.68	1.42

Source: General Statistics Office of Vietnam (various years).

According to IFPRI–MARD (2001), the increase in live weight in Vietnam is mostly due to increases in the size of the national herd, rather than improvements in productivity. Productivity is defined as the output produced/head per year (based on slaughter weight). Productivity is high when a high slaughter weight is achieved within a short production period. In 1999, average productivity levels reached about 70 kg for pigs, 1.5 kg for chicken, 210 kg for cattle and 156 kg for buffaloes (Table 2). Cattle showed the highest growth rate in live weight at about 2.5% per year during the period from 1990–99, followed by pigs (2%), buffaloes (1%), ducks (0.7%) and chicken (0.4%) (Table 2). With the exception of buffaloes, growth rates have been remarkable over the last five years, especially for cattle (4.5%) and pigs (3.1%).

Table 2. Livestock productivity and growth rate in productivity ratio by type of domestic animal, Vietnam, 1990–99.

Species	Productivity 1999 (kg/head per year)	Increase (%)		
		1990–95	1995–99	1990–99
Pig	69.8	0.96	3.11	1.92
Poultry	1.5	-0.21	1.35	0.48
Chicken	1.5	-0.32	1.35	0.42
Duck	1.5	0.13	1.35	0.67
Cattle	210	0.82	4.49	2.45
Buffalo	156	3.93	-2.62	1.025

Source: General Statistics Office of Vietnam (various years).

Increases in the proportion of crossbred and exotic animals in the livestock herd in Vietnam have been partially responsible for the increases in offtake rates over the past ten years. While the pig herd size has increased by 5% per year, the average production of live weight has grown at around 7% per year. The size of the national poultry flock increased at an average rate of 5.9%, and production (in live weight) increased at an annual average rate of 6.3%. This annual increase in offtake is in part due to an increased adoption of improved breeds with higher slaughter weights and earlier slaughter ages. Further increases in offtake rates are likely to be driven by increased adoption of exotic breeds by producers and improvements in the quality of crossbred animals used by farmers.

3.1.1 Pigs

The Vietnamese pig herd increased gradually over the years. The number of pigs increased from 12 million in 1985 to 17 million in 1996 and 19 million in 2000 (General Statistics Office of Vietnam, various years). The total live weight of pig also increased from 560 thousand tonnes in 1985 to 1 million tonnes in 1998 and about 1.4 million tonnes in 2000 (General Statistics Office of Vietnam, various years). Figure 2 shows the distribution of pig production by region in Vietnam. During the last 10 years pig

production has been growing rapidly in the Red River Delta, the North-East and the South-East compared to the other regions of the country. The slaughter weight has also increased from 45 to 60 kg/head (Vu Trong Binh et al. 2000). While the majority of smallholder households own from 1 to 4 animals, there was a marked increase in the number of pigs of up to 100 head owned by households in certain areas of the country.

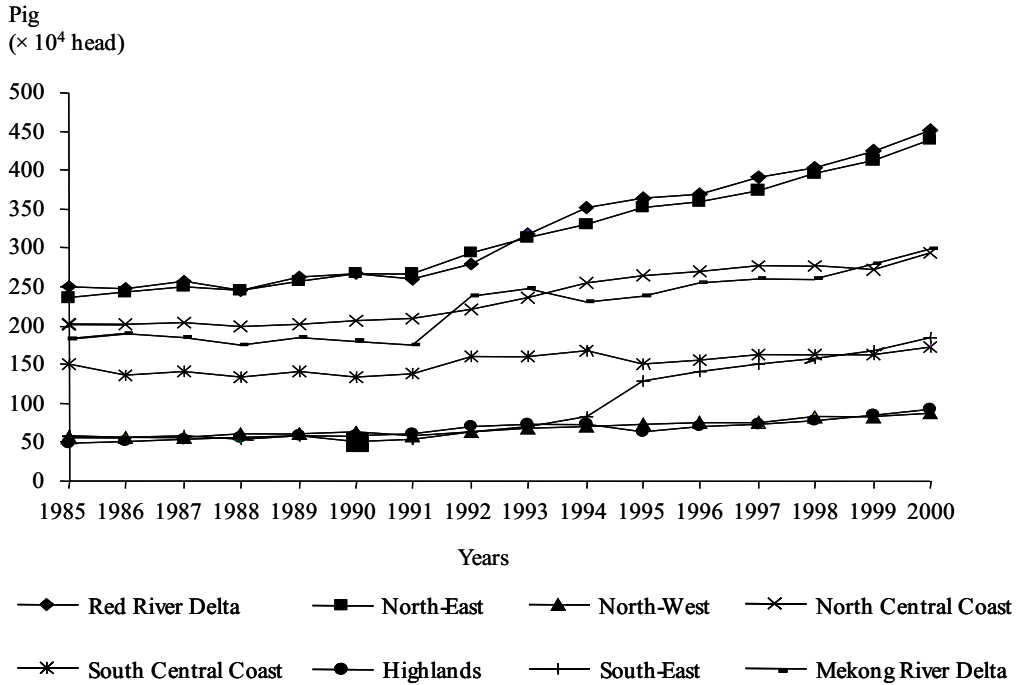


Figure 2. Pig production by region, Vietnam, 1985–2000.

3.1.2 Poultry

The number of poultry in Vietnam amounts to 183 million birds, of which 140 million are chickens and 43 million are ducks, Muscovy ducks and geese. The chicken population of the northern provinces is 91 million birds, or 65% of the total national chicken population. The majority of the poultry are found in four regions, namely the Northern Mountains and Midlands, the Red River Delta, the North Central Coast and the Mekong River Delta, which account for almost 75% of all poultry. Duck production is mainly found in the two river delta areas. Figure 3 shows the distribution of poultry production (by live weight) across the different regions in the country. It is shown that poultry production has been increasing in general across the regions, but more rapid increases have occurred in the South-East and the Red River Delta during the last 4–5 years. While there was a decline in production in the Mekong River Delta in 1997–98, the trend has been reversed from 1998 to 1999.

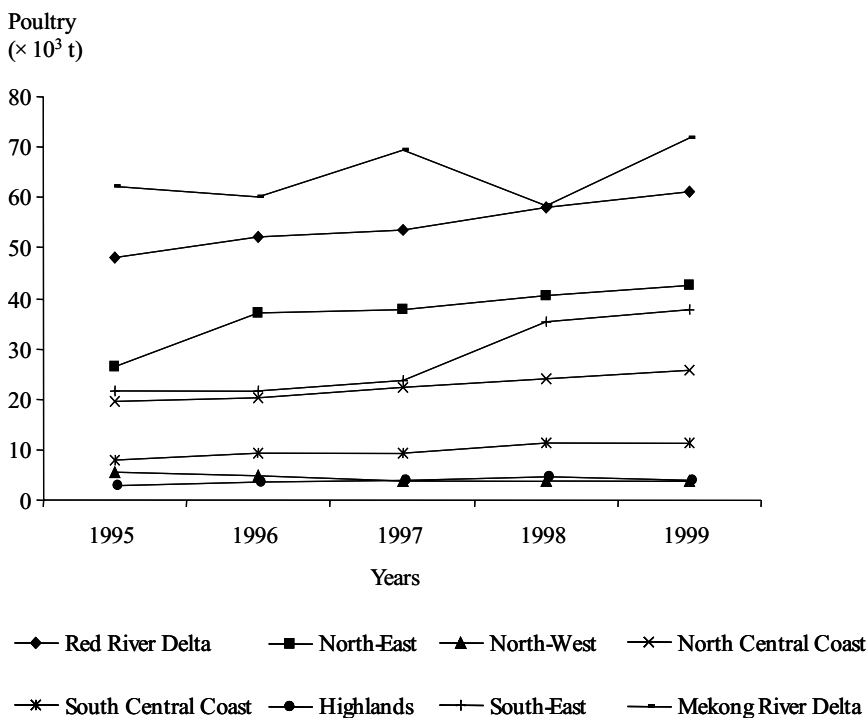


Figure 3. Poultry production by region, Vietnam, 1995–99.

Together the Red River Delta and the Mekong River Delta are the largest producers of poultry in the country. The duck, Muscovy duck and geese population is 15.2 million birds, or 35% the national duck population. While the chicken population is high, the production of eggs and meat is still very low (5-month old local chicken broiler live weight is only 1.3–1.5 kg and local laying capacity is about 70–80 eggs/hen per year); which is about one-third of the yield of the high-yielding breeds of chicken in other parts of the world. Figure 4 shows the distribution of egg production across regions in the country. Both the Red River Delta and the Mekong River Delta are big producers of eggs, with rising egg production in the Mekong River Delta but decreasing production in the Red River Delta. The system of production in the north is traditional with about 20–30 chickens per family and largely based on local feeds. Consequently, breeding, feeding, shedding and health management are not receiving much attention. Farmers are generally faced with problems of diseases, high mortality and low margins from chicken production.

3.2 Number of households keeping livestock

According to Vu Trong Binh et al. (1998), about 98% of households in the Red River Delta keep livestock. While no similar documentation is available for the other regions in Vietnam, it is estimated that conditions are similar in other areas.

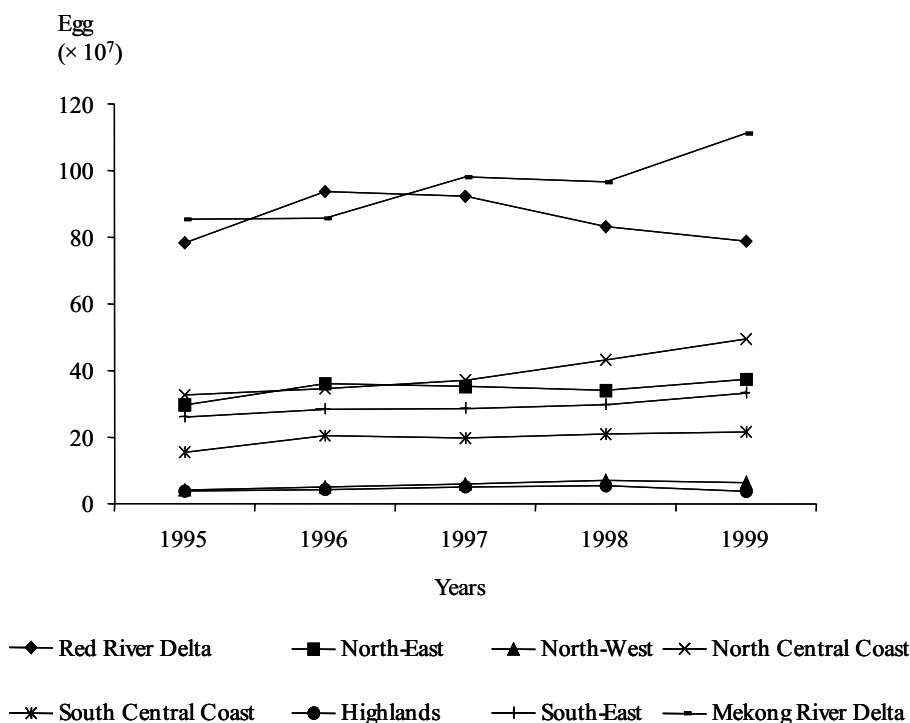


Figure 4. Egg production by region, Vietnam, 1995–99.

3.3 Composition of the industry

3.3.1 Pig industry

There are several pig production systems, namely, state-owned enterprises, private commercial pig farms, small-scale pig production systems and integrated production systems.

State-owned farms account for 4–5% of the total pig production. These farms have played a crucial role in genetic improvement and disseminating techniques to develop larger scale pig production and are scattered all over the country.

Private commercial pig farms produce about 15% of all pigs. These farms rear between 10 to 500 fatteners with 5 to 100 sows. Some farms only produce weaners, others only fatten pigs, while some do both. The private commercial farms are situated around Ho Chi Minh City.

Small-scale pig production accounts for as much as 80% of the total production. Local breeds or crossbreeds between local and exotic breeds are used. Each farm keeps 1 to 2 sows and less than 10 fatteners. This system exists all over Vietnam, but is developed to a different extent in different provinces in the country.

According to Vu Trong Binh et al. (1999), an integrated system involving breeding stock, feed supply, fattening and slaughter processing is a recent development in pig

production in Vietnam. Foreign companies are investing capital to build up these systems, each with a capacity of 20–200 thousand pigs. This system is strongest in Ho Chi Minh City because of the sharp increase in demand for pork meat in the richer southern Vietnam.

The level of development of the pig business around Ho Chi Minh City is different from that of the Red River Delta in terms of production systems (breed, genotype, feeding, size of stock farms) with fattening and distribution carried out on a much wider scale. However, the benchmark for all transactions, be they technical or economic, is the same as those of the North, since these transactions are, in both localities, conducted through visual evaluation and underground sale. The players operate as individuals and the business is not organised into operators' associations. There is no system in place to ensure product quality along the commodity chain.

A number of large-scale players such as feed manufacturing and stock development companies as well as the State company, VISSAN, are currently active. This trend also exists around the city of Haiphong but on a smaller scale. While these players at times enter into export agreements, the nature of the transactions with the other actors in the local market remains unchanged.

The stock farms outside the Ho Chi Minh City in the South seem to be endowed with a technical system more advanced than in the farms in the Red River Delta outreach areas. However, the situation of the business, despite the differing technical levels, is the same in terms of the level of organisation of producers and transactions. With the exception of Dong Nai and the areas around Ho Chi Minh City, pig production and business in the Mekong Delta and other regions of the South do not significantly differ from those in the Red River Delta.

3.3.2 Poultry industry

Poultry production plays a very important role in rural Vietnam. Poultry ranks second behind swine, and accounts for 19% of the total livestock production. More than 80% of the poultry production in Vietnam is based on traditional production systems at the smallholder level. Apart from supplying the family with high quality protein, poultry also provide cash income through the sale of meat and eggs. In most cases, the poultry are left scavenging during the daytime and are either kept indoors with the family, or in a separate hen house or with other livestock during the night. Even though all farmers keep chicken, there is little awareness about the management and daily care of chickens and therefore these production systems are often called 'low input–low output' systems.

There are now many families keeping flocks of 1000 to 10 thousand birds. In 1999, there were 136.1 million chickens produced, of which 101 million were local and exotic coloured-feather chicken breeds. This amounted to a total value of nearly two trillion Vietnamese dong (VND)¹ and contributed to poverty alleviation in rural and mountainous areas. From 1990 to 1999, the annual average growth rate of poultry

1. In 2002, US\$ 1 = Vietnamese dong (VND) 15,325.

production was 5.7%. The industrial production of poultry is commonly found in the Red River and Mekong River deltas.

Three different farming systems of chicken production exist in Vietnam, namely, the traditional system (extensive system), the semi-industrial system and the industrial system (intensive).

The traditional system is a scavenging or extensive system and has existed for a long time throughout Vietnam. The characteristics of this system are low initial investment, with chicken allowed to scavenge, looking for feed and breeding independently. The chicken house is simple. Chicken can be raised in the garden without fences. Rearing time is long; normally it takes 6 months for the chicken to reach slaughter weight. Due to the scavenging system, management input is low and the chickens easily contract diseases, suffer heat and cold stress, and consequently have a low survival rate. However, the advantage of this system is the low initial investment. Poor farmers can keep some dozens of chicken and although the system is not very productive nor producing a high income, it is adoptable by almost any household. The meat of chickens raised in this system is preferred by many consumers for its taste and obtains a premium price. This system produces about 65% of total broiler chickens or about 70 million birds per annum.

The semi-industrial system combines more advanced technologies with the traditional system. Nutrition and disease control are given more attention. Under this system, chickens are reared for sale. Chickens are reared by batch, each batch containing 200 to 500 or even 1000 birds. This type of system requires large areas, (at least 0.01 to 0.02 ha depending on the size of the flock) fenced by bamboo or steel wire, with space for the chicken to move around.

Capital is needed to build the chicken house, and facilities like feeders, drinkers and brooders for young chicks. In addition to the naturally available feed resources such as worms, insects, vegetables and grasses, chicken receive additional feed to reduce the rearing time and increase production. In villages along riverbanks or where there are large areas of unused paddy fields after harvest, chicken can be taken to the fields during the day. They gather the dropped grains and this reduces the cost of feeding. Compared to the traditional extensive system, chickens raised in the semi-intensive farming system have a higher growth rate, greater survival rates and lower incidence of diseases. The time required to reach slaughter weight is shorter, which means the system is more efficient in terms of feed use. In recent years, this farming system has been applied widely in the delta, hilly and peri-urban areas where the households have sufficient funds and more land area. Thousands of farms with 500 to 2000 birds per batch have been built and 1–3 batches per year are raised. The exotic coloured-feather chicken breeds like Jancun, Luong Phuong, Kabir crossbreeds are used in this farming system. About 10–15% of the total number of chicken (or about 14 million birds) in the country were reared in this system in 1999.

During the 1970s and 1980s, the industrial systems were state-owned enterprises, but later some industrial chicken farms of small and medium size were established. These stock farms were often established through joint ventures or even with full

foreign investment, and companies such as the Viet-Thai Company, CP Group, Proconco, and Cargill have become involved.

Before the 1990s, the industrial chicken breeds reared in Vietnam were Leghorn, Plymouth Rock, Hybro and BE. The Cuban Government provided these breeds. Since 1990, many parent stocks and commercial chicken breeds have been imported to Vietnam such as the meat types from Arbor Acres, ISA-MPK, Avian, Ross 208, Lohmann Meat, and layer breeds such as Goldline, ISA Brown, Hyline, Brown-Nick, Babcock B-380 which led to the diversification of chicken breeds in Vietnam. In addition, some coloured-feather chicken breeds reared by the industrial farming system were also imported into Vietnam, such as Sasso, Kabir, ISA-JA57, (Jancun) Three Yellow 882, L-ng Ph-ing etc.

Although the industrial system was established in 1974, it is not as well developed as in other countries in the region. It is still very weak and faces problems regarding breeds, housing and feeding. In 1988, the industrial chicken farming system had to cope with big price changes associated with new managerial arrangements, and there was a large decrease in chicken, meat and egg production, especially in the period of economic reforms during 1989–91. At that time, many state-owned enterprises suffered losses and were on the edge of collapse.

From 1992 to 1995, livestock and poultry production recovered quickly due to changes in the market conditions. Since 1996, when strong competition arose between many small and large companies (both local and foreign), the industrial chicken system has again had a difficult time. The emergence of many foreign investors that possess capital, new technology and marketing support reduced the market share of the state-owned companies from 36% in 1995 to 15% in 1999. The remaining market share was held by joint ventures or fully owned foreign companies.

The industrial poultry farming system in Vietnam is not yet fully integrated across all production levels. The state-owned companies, joint ventures, or fully owned foreign companies import eggs and day-old chicks from overseas. Broiler chicken production is carried out by private farms or households, which are still financially weak and lack access to technology, health care and marketing skills. Additionally, the Vietnamese consumers have not become accustomed to using readily processed chicken and eggs yet. Market supply of poultry products has not steadied yet and this has discouraged consumption. Thus, industrial production has not proved to be very successful. In addition, there are many other shortcomings in housing, equipment, management skills, technology and the quality of the breeds used. Therefore, there will continue to be difficulties in state-owned and other companies. However, the industrial chicken and egg production in Vietnam is likely to grow as the above problems are solved and it is foreseen that the industry will follow a similar growth path as in the other countries in the region.

There are large variations in the breeds of chicken used in Vietnam. The local chicken breeds and the exotic coloured-feather chicken breeds are popular in the regions of North-East, North-West, North Central Coast, South Central Coast, Central Highland and Mekong River Delta. In the Red River Delta and North East of Southland, the proportion of the scavenging chicken breeds to the commercial chicken breeds is 60:40. Overall, local breeds (Ri, Ri Pha, Mia, Dong Tao, Ho, crossbred and

coloured-feather chicken breeds for extensive rearing) comprise nearly 70% of the total number of chickens, the remainder being commercial chicken breeds for intensive rearing.

3.3.3 Poultry meat production

Corresponding to the increase in bird numbers, the amount of chicken meat produced increased in all agro-ecological regions. In 1988, 102 thousand tonnes of chicken meat were produced whereas in 1998, 175 thousand tonnes were produced, an increase by a factor of 1.7. This represents an annual increase of 7.34 thousand tonnes. The Red River Delta region produced about 28% of total production, followed by the North-East, which produced another 22%. The Mekong River Delta accounted for about 16% of total production, while the North-East of Southland had about 11%.

The Mekong River Delta is famous for its duck production with a duck population of more than 50% of the flock of the country. Due to different socio-economic conditions and technical skills of the people in the different regions, the investment in and efficiency of chicken production is very varied. In the remote areas of the North-East, Central Highlands and North Central Coast, chickens are often reared by grazing and making use of agricultural by-products. In the delta regions and suburban areas, e.g. the Red River Delta and the North-East of Southland, chickens are reared in a more intensive manner with greater economic efficiency. In these latter areas the use of exotic breeds, industrial feed and advanced technologies is more than in the remote areas.

3.4 Contribution to the household income

Table 3 shows the contribution of livestock to gross agricultural income by farm size. Livestock accounted for a large proportion (80%) of gross agricultural income. This was most evident for large farms, which receive 95% of gross agricultural income from livestock production. In small farms, the share of livestock was 75%.

Table 3. Share of gross income from livestock to total agricultural income, 1999.

Farm size	Livestock gross income as a share of total gross agricultural income (%)
Small farms	74.96
Medium farms	90.43
Large farms	94.97
All farms	80.1

Source: IFPRI-MARD (2001).

Table 4. Type of pig sold per households in the Red River Delta.

Type of pig sold	Piglets				Meat pig			
	Scale of pig raising		Less than 6		More than 6			
Rice sale	No	Yes	No	Yes	Yes		No	
Type of household	A	B	C	D	E	F	G	H
Number of meat pigs/year	–	–	3	3	7	9	24	326
Weight of pigs (kg/head)	–	–	73	64	76	82	92	25
Price of pig (VND/kg)	–	–	8387	8811	9261	9530	8974	10,948
Cost of feeding (VND/kg)			2345	2437	2228	2466	2004	2017
Cultivated land/person (ha)	0.15	0.06	0.043	0.079	0.101	0.061	0.04	0.018
Quantity of paddy sold/year (kg)	–	722	–	1012	632	–	–	–
Paddy selling price (VND/kg)	–	2699	–	2240	2313	–	–	–
Paddy yield (kg/sao*)	151	170	170	168	170	180	171	156
Paddy production/person (kg)	593	536	362	631	727	515	335	90
Quantity of piglets sold/year (kg)	381	293	–	–	–	–	–	–
Weight of piglet (kg/head)	12.1	10.6	–	–	–	–	–	–
Price of piglets (VND/kg)	11,798	11,655	–	–	–	–	–	–
Income/person ($\times 10^3$ VND)	1915	1345	1047	1417	2365	1372	2984	3008
Income from rice (%)	26	54	40	52	41	49	17	4
Income from meat pigs (%)**	–	–	–	–	–	~	15	41
Income from piglets (%)**	17	9	–	–	–	~	–	–
Income from other agricultural activities (%)	43	15	23	14	15	32	5	2
Income from food trade or processing activities (%)	4	–	12	2	–	–	55	47
Income from other non-agricultural activities (%)	3	10	14	25	31	16	5	
Other incomes (%)	8	12	11	8	12	3	3	–
Estimated proportion in total population (%)	< 5	< 5	10	50	< 5	< 5	15–25	< 5

cont'd ...

Table 4. Cont'd.

Type of pig sold	Piglets				Meat pig			
			Less than 6		More than 6			
Scale of pig raising	No	Yes	No	Yes	Yes	No		
Rice sale								
Type of household	A	B	C	D	E	F	G	H
Number of surveyed households	4	7	17	40	9	9	21	5
Main location: Provinces of Ha Tay (HT) and Nam Dinh (ND)	HT 75%	ND 57%	ND 65%	ND 70%	HT 80%	HT 78%	HT 75%	HD 100%

* 1 Sao = 360 m² = 0.036 ha.

** Pig and piglet raising do not yield much cash most of the time because the costs of feeding are high. Therefore, even for farmers selling around 10 pigs/year, net income from pigs appears close to zero. However, pig income does not include the value of manure produced by pigs and used on rice fields to increase yields.

N.B. Type A = Piglet raising farmers.

Type B = Mixed piglet-rice selling farmers.

Type C = Small poor subsistence farmers.

Type D = Rice sellers.

Type E = Combined pig raising-rice selling farmers.

Type F = Middle scale pig raisers.

Type G = Farmers combining feeding trade and big scale pig raising.

Type H = Big scale half-raised pig raisers.

Source: CIRAD-VASI/Ecopol project (2000).

A survey of households in the Red River Delta shows that income from pig production (fatteners or weaners) accounts for a share of 9 to 41% of total household income (Table 4). The highest contribution was observed for households with a relatively large number of pigs. The lowest contribution was observed among households that were also engaged in rice production. For the latter, it is possible that rice production was the main activity in the farm.

A survey of households in Quoc Tuan commune in Hai Duong indicated that income from livestock was an important component of household income, accounting for about 20% in 1988 and increasing to about 32% of total household income in 2000. Within income from livestock production, the contribution of pig production was between 20 and 29% during the period from 1997 to 2000 (Table 5).

Table 5. Percentages of average income of households in Quoc Tuan, Hai Duong, Vietnam.

Source of income	1988	1993	1997	2000
Total income	100	100	100	100
Income from rice	32.26	27.09	21.27	20.4
Income from animal husbandry	19.58	17.24	32.62	32.3
Pigs	–	–	28.92	20.19
Poultry	–	–	3.7	11.77
Cows	–	–	–	0.33
Income from off-farm activities	12.53	13.87	14.73	15.1
Other income	35.63	41.8	31.38	32.2

A similar survey in Thai Tan commune in Hai Duong indicated that income from livestock production ranged from about 26 to 39% with income from pig production accounting for 19 to 20% in 1997 and 2000, while the contribution of cattle only amounted to about 2% (Table 6).

Table 6. Percentages of average income of households in Thai Tan commune, Hai Duong, Vietnam.

Source of income	1988	1993	1997	2000
Total income	100	100	100	100
Income from rice	28.22	30.55	31.66	22.64
Income from animal husbandry	39.31	31.96	26.04	33.09
Pigs	–	–	18.94	19.88
Poultry	–	–	7.1	11.04
Cows	–	–	–	2.18
Income from off-farm activities	12.22	11.56	5.57	8.97
Other income	20.25	25.94	36.73	35.3

Source: Dao The Anh (2003).

3.5 Structures of livestock production

Livestock production has evolved over the years into three types, namely subsistence, semi-commercial and commercial/industrial.

The subsistence type is largely based on crop production, with animals subsisting on crop by-products. This system has been the basis of household livestock production in the North and the Central region for many years. This system is still popular but its importance has recently been decreasing. In Haiduong province, for example, pig production under this system accounts only for about 20% of pig production in the area. However, its share is somewhat higher, about 30% in Hatay province, and around 70% in Namdinh province. According to studies conducted by the Vietnam Agricultural Science Institute (VASI), smallholders mostly produce from 2 to 5 pigs per year. This mode of pig production has very little or no linkage to the market, but rather is closely integrated with crop production because of the use of manure for fertilising fields and the use of crop by-products as feed.

In the semi-commercial type, production decisions are based on market price information for animal feed and livestock products. The number of pigs raised has increased to hundreds of heads yearly over the last decade. The majority of households engaged in this production system are likely to become more specialised in livestock production. These households are relatively predominant in many rural areas, but in varying proportions depending on the region. In Haiduong province, about 36% of all households have between 20 and 60 fatteners per year and about 3% of all households raise more than 60 animals per year. In Hatay province, around 60% of all households are engaged in pig production and raise more than 60 animals per year. Of these households, about 10% are raising fatteners. In Namdinh province, this proportion is about 20%. In the Red River Delta, shortage of land constrained smallholders from increasing the number of animals produced. On average, households own an area of only about 0.05 ha. Even within this type of production system, there is diversity in management across households. Some households use feeds produced at home, while others buy. Some households consider this activity as a secondary activity. Households that are operating at a relatively larger scale often also carry out other production activities such as the processing of agricultural products that support livestock activity. Currently, only few households have a well functioning livestock production; some even manage without seeking income from other activities. The number of households that have managed to link their production operations closely to the market is, however, still limited.

For those households keeping poultry under the semi-commercial system, improved poultry breeds (foreign strains or crossbreds) are being used. These households breed and sell poultry in batches. They often have close relations with the breed companies that supply them with feeds. Likewise, they have ties with wholesalers and large companies. The size of these farms ranges from hundreds to thousands of birds.

The commercial/industrial type differs significantly from the household-based system. These farms employ more labour and foreign companies such as CP, Proconco and Cargill, among others provide capital. Many farms of this type produce mainly for export. The large farms have some comparative advantage over the household-based system because the large farms have the ability to sell a big number of pigs on a regular basis and in accordance with

the quality requirements of big companies. In Vietnam, there is an arrangement known as contract growing,² which is also common in many developed countries. Farms engaged in this arrangement are highly dependent on foreign companies for investments. The increase in the number of these contract farms will most likely result in the domination of the Vietnamese meat market by foreign companies unless more equitable institutional arrangements can be put in place. Under the current scenario, millions of smallholder households will lose their market share and subsequently become employees of these large firms if prevailing arrangements persist. In the situation where livestock play an important role as a source of income for the majority of small farmers and where the industry and service sectors cannot yet attract labour, the market domination of these foreign companies will cause the disappearance of household-based livestock production which until now is the backbone of the livestock sector in Vietnam.

In the past, the government has made large investments in the development of the pig and poultry breeding systems, especially in the development of large-scale farms to serve as a model for livestock production development in Vietnam. Some state-owned large-scale projects included investments in large-scale farms. However, the success of these farms has been highly unstable because it is highly dependent on foreign companies. Because of the huge investment needed, the development of farms of this scale will never be suited for the millions of pig and poultry rearing households in Vietnam.

3.6 Economics of production

An IFPRI–MARD (2001) study has shown that diseconomies of scale exist in poultry and pig production. The study estimated economies of scale by regressing the log of size (in terms of animal revenue and in terms of animal inventory) against the log of profits:

$$\text{Log (profit)} = a + b \text{ log (size)}$$

If the coefficient of \hat{a} was positive and less than 1, the industry was considered to have diminishing returns to scale. On the other hand, if the coefficient of \hat{a} was positive and greater than 1, then the industry exhibited increasing returns to scale. The estimated coefficients in the IFPRI–MARD (2001) study are shown in Table 7. All estimates of \hat{a} for pig and chicken production systems were positive and less than 1, which means that there were diseconomies of scale in both production systems.

2. Contract growing is an arrangement between an individual grower and a company (usually engaged in feed mill or meat processing) for the former to undertake production activities, like the fattening of pigs to a specified weight, with the company providing all the inputs and other technical support. The company buys the output of the grower at a specified price depending on whether the grower has met certain product standards required by the company. In most cases, the grower is only required to provide some housing facilities for the animals and/or labour.

Results of the IFPRI-MARD (2001) study revealed that profits were increasing at a slower rate than inventories and revenues. This implies that the efficiency levels of smaller farms, based on raising local animals with low cost feedstuffs, are higher than those on larger farms employing intensive high quality feed production techniques.

Table 8 shows sample budgets for raising pigs. The analysis shows that raising pure Mong Cai pigs to a slaughter weight of more than 25 kg is not profitable. Male pigs from multiplication herds are better slaughtered as piglets in order to increase profits.

Table 7. Estimated coefficients of return to scale equation.

Animal type	Dependent variable	Independent variable	$\hat{\alpha}$	$\hat{\alpha}$
All animals	Log (Livestock profit)	Log (Livestock revenue)	0.165	0.887
Pigs	Log (Livestock profit)	Log (Livestock revenue)	0.419	0.864
	Log (Livestock profit)	Log (Pig inventory)	7.47	0.664
Poultry	Log (Livestock profit)	Log (Livestock revenue)	0.63	0.827
	Log (Livestock profit)	Log (Poultry inventory)	5.66	0.67

Source: IFPRI-MARD (2001).

Table 9 illustrates the economics of poultry production under different systems. The simple calculations show that even with rather low yielding animals, it is possible to make profit from poultry production. However, other costs might have to be included depending on the degree of sophistication of the production system. Raising crossbred pigs for slaughter, on the other hand, provides a reasonable profit. However, this profit is dependent on the quality of the pigs. A study made in the Red River Delta indicates that the feed conversion ratio (FCR) varies from 3.4 to 3.8 kg feed/kg gain. In the analysis, slightly more pessimistic FCRs of 3.5 and 4.0 were used. With 3.3 pigs going through a pen per year, the profit ranges from VND 419 thousand to 620 thousand per year for a single pigpen. However, if the price for slaughtered pigs is less than VND 10 thousand/kg, there is no or very little profit unless the production cost can be reduced. The Mong Cai sow producing 1.8 crossbred litters provides an estimated profit of around VND 660 thousand/year.

Cau (1995) as cited in MARD (2000) set up a scheme with estimations on the distribution of costs (Table 10).

3.7 Marketing channels

The marketing (product flow) for cattle, pig and chicken presented in this section is based on an IFPRI-MARD (2001) report, which surveyed meat and livestock marketers. The sample consisted of 406 meat and livestock marketers, which include 90 traders, 150 wholesalers and 166 retailers drawn from across Vietnam.

The marketing channels for slaughter cattle are shown in Figure 5, which gives the percentage of cattle sold through different channels. The cattle marketing system is composed of four middlemen, namely, the trader, wholesaler, slaughterer and retailer. Live cattle are sold to wholesalers and retailers while carcasses and meat are sold to retailers or directly to households.

Figure 6 shows the marketing (product flow) for pigs. Similar to the cattle-marketing channel, the pig marketing system is composed of four middlemen. These are the traders, wholesalers, slaughterhouses/meat processors and the retailers. Live pigs and piglets are primarily sold to traders, wholesalers and slaughterhouses while pig carcasses and other meat products are usually sold to retailers or directly to consumers.

Table 8. Economics of smallholder pig production, Vietnam.

Description of item	Cost (VND)*	
Pure Mong Cai piglet, slaughtered at 25 kg		
Input:	253,500	
1. Mong Cai piglet	150,000	
2. Veterinary service, vaccination	4500	
3. Feed: 10 kg gain at 5.5 kg feed	99,000	
Output:		
1. Slaughter price	275,000	
Profit per pig	21,500	
Profit/year per pig (1.8 litters/year)	38,700	
Mong Cai × Large White crossbred piglet	FCR** = 3.5	FCR = 4.0
Input:	581,850	642,900
1. Crossbred piglet	150,000	150,000
2. Veterinary service, vaccination	4500	4500
3. Feed: 55 kg gain at 4 kg feed	427,350	488,400
Output:	770,000	770,000
1. Slaughter price	770,000	770,000
Profit per pig	188,850	127,100
Profit per year (3.3 pigs)	620,895	419,430
Mong Cai sow		
Input:	1,605,300	
1. Mong Cai, 70 kg	770,000	
2. Insemination	9500	
3. Feed, pregnancy, 228 kg	410,400	
4. Feed, lactating, 125 kg	225,000	
5. Feed, empty, 10 kg	18,000	
6. Feed, piglets, 12 kg/pig	172,800	
Output:	1,970,000	
1. Piglets at 15 kg	1,200,000	

2. Value of sow	770,000
Profit per sow and litter	364,700
Profit per sow per year (1.8 litters/year)	656,460

* In 2002, US\$ 1 = VND 15,325.

** FCR = Feed conversion ratio.

Source: Adapted from Ministry of Agriculture and Rural Development, Vietnam.

The product/marketing flow for chicken is shown in Figure 7. The marketing channels in the chicken marketing system are similar to those of the pig marketing system. Live chickens are usually sold to wholesalers and retailers, while carcasses are sold to wholesalers, retailers or directly to consumers.

Table 9. Economics of smallholder poultry production, Vietnam.

Description of item	Cost (VND)*
Broiler production	
Input:	23,750
Day old chicks	3500
Veterinary service, vaccination	4500
Feed: 90 days at 0.05 kg/day = 4.5 kg	15,750
Output:	36,000
Slaughter price	36,000
Profit per chicken	12,300
Profit per year (3.6 chickens)	44,280
Egg production, semi-scavenging (half feed)	
Input:	78,362
Laying hen, 18 weeks	30,000
Feed: 365 days at 0.05 kg/day = 18.25 kg	48,362
Output:	160,000
Eggs (200 per year)	160,000
Profit/hen per year	81,638
Egg production, intensive	
Input:	157,750
Laying hen, 18 weeks	30,000
Feed: 365 days at 0.10 kg/day = 36.5 kg	127,750
Output:	240,000
Eggs (300 per year)	240,000
Profit/hen per year	82,250

* In 2002, US\$ 1 = VND 15,325.

Source: Ministry of Agriculture and Rural Development, Vietnam.

Table 10. Scheme with estimates of cost distribution.

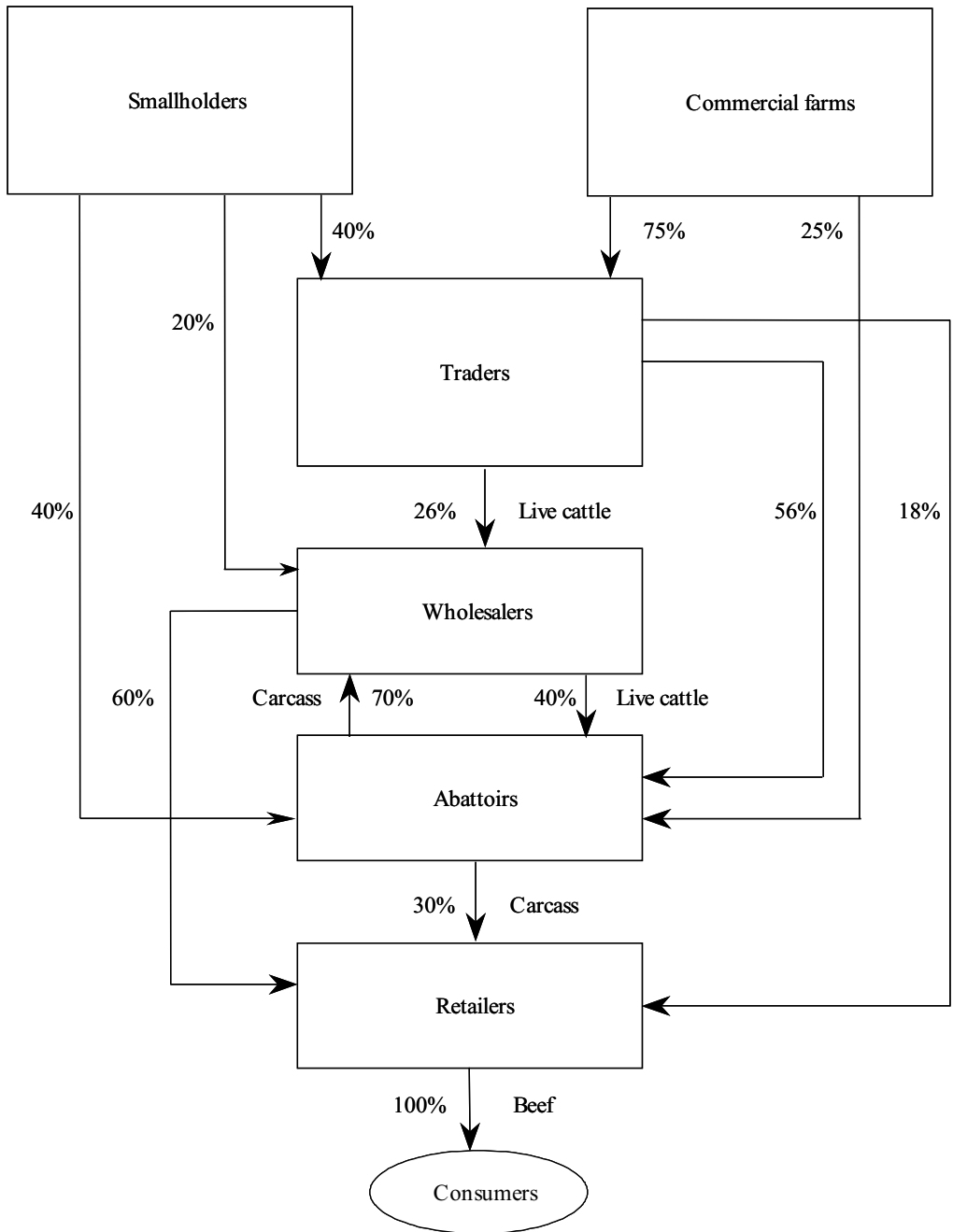


Figure 5. Slaughter cattle marketing channels (numbers represent percentage of sales through channel).

Items	Cost structure: Eggs (%)	Cost structure: Chicks (%)
Feed	70–75	60–65
Breeders	18–20	20–25

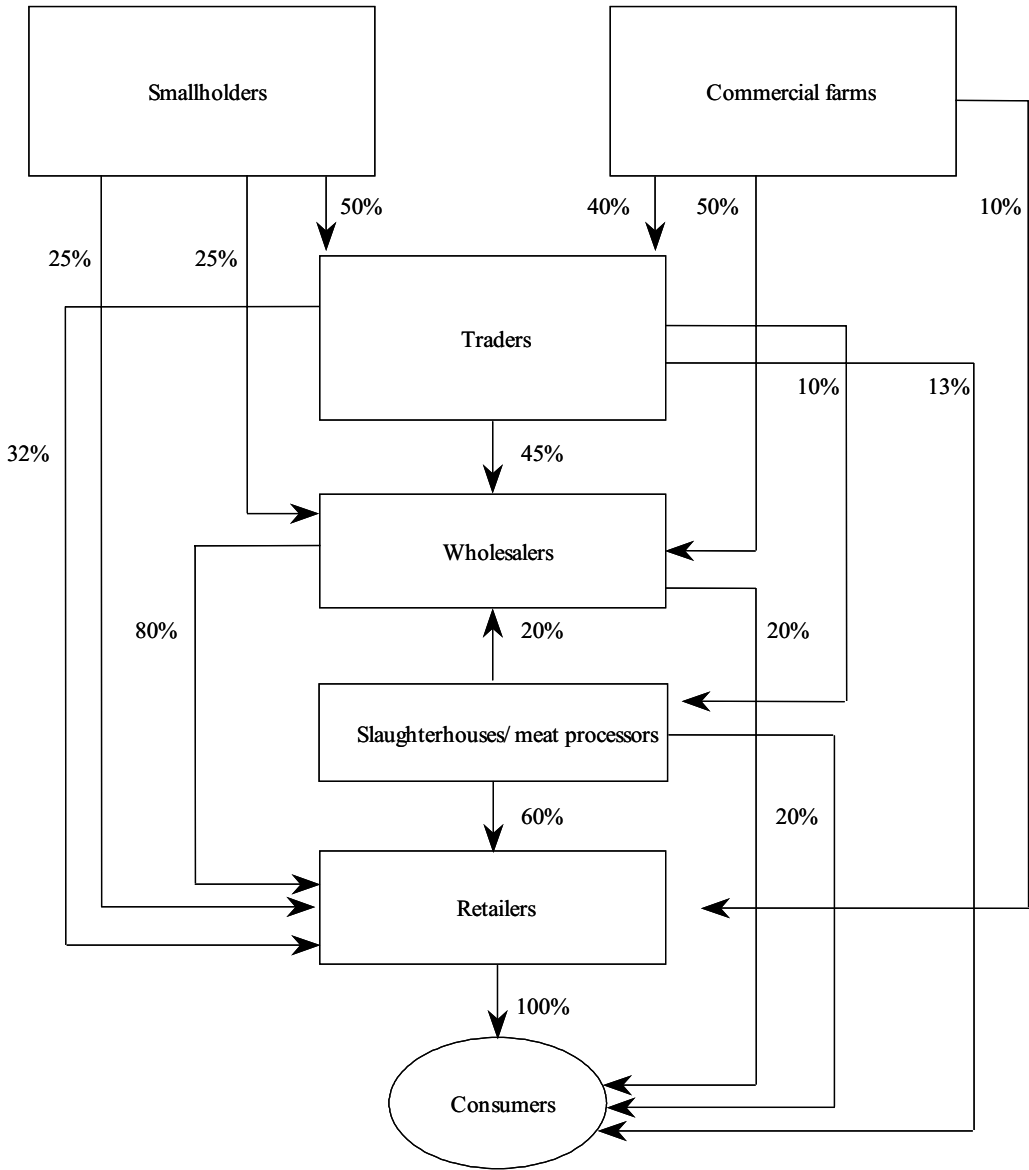


Figure 7. Slaughter chicken marketing channels (numbers represent percentage of sales through channel).

Source: Cau (1995, cited in MARD 2000).

3.7.1 Commodity flow for pigs

According to Vu Trong Binh and Casabianca (1996), the major market agents are private small-scale meat suppliers, which operate within a network of channels from

production to consumption. There are some government companies that are also engaged in this field, namely VISSAN in Ho Chi Minh City, and ANIMEX, among others. The activities of these larger scale government companies concentrate mainly on the export market and get government assistance. Only VISSAN supply meat for the Ho Chi Minh City market. In recent years, private companies have started to engage in the pork export market in the southern region, as well as in Haiphong and Namdinh provinces. There are slaughterhouses in Hanoi and Ho Chi Minh City that serve the domestic market; however, these are not officially registered and hence, are not properly monitored by the government. Consequently, the risk of their spreading contagious diseases due to inappropriate hygiene conditions prevailing at their facilities has not been assessed. Moreover, due to their unregistered state they are able to avoid the payment of government taxes.

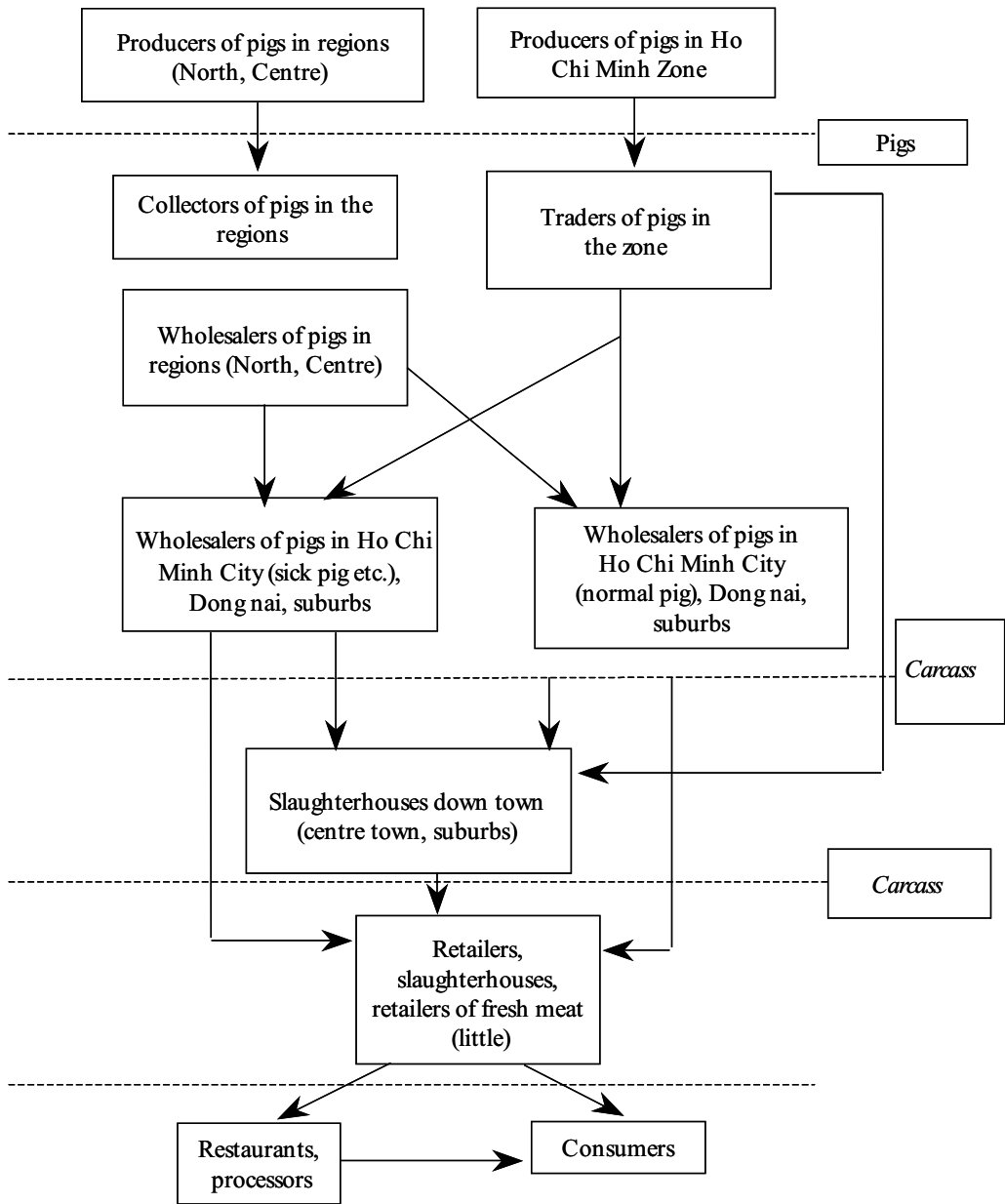
In its current state, the commodity chain for pork in Vietnam has no clear legal standing. The prevalent organisational set-up in pork trading often is beyond the control of the government. This situation creates many difficulties in the exchange process and limits the further development of the commodity chain. Firstly, it does not differentiate between official vis-à-vis unofficial institutions, so that in many instances, government assistance has been re-directed to intermediate government companies more than to the smallholders for whom the assistance was originally intended. The government companies, on the other hand, receive export quotas although they also depend on the network of private collectors to buy pigs. Most of these companies have been provided investment support by the government, despite only making a small contribution to livestock production and the development of the sector.

Figure 8 gives details of the structure and activities that prevail with regard to the pig commodity chain, including the various actors in the chain. The focus lies on the Mekong River Delta in South Vietnam, where pig production is a rapidly growing industry. The figure illustrates a sample of an existing marketing flow of pigs in the Mekong River Delta; in this case Ho Chi Minh City.

Different types of individual collectors are to be found in the Mekong River Delta pig sector. They operate underground or without legal personalities, and exhibit the same characteristics as the collectors in the North. All transactions are undertaken without sanitary and carcass quality control. One large State Company, VISSAN, handles collection, slaughter, meat processing and marketing single-handedly. However, the quantity collected by this company accounts for only a modest proportion of the large market of the South. VISSAN's collection modality is similar to that used by other collectors, procurements being based on visual assessment of animal body weight and condition.

According to Vu Trong Binh (2002), a typical sales negotiation between a pig producer and a collector can be described as follows:

- pig quality is determined visually, like in the North, with physical appearance (or shape) and breed type as yardstick
- purchase by weigh band estimate is common (no weighing), but many producers also practice weighing during sale



Source: Vu Trong Binh (2002).
Figure 8. Product flow of pigs in Ho Chi Minh City.

- sales are carried out in batches, and transportation is done in small trucks or motorcycles

- individuals or groups organise sales, and the collector searches for offers by telephoning producers or visiting families
- pig quality requirements are a lot higher than those observed in the North. Pigs with high fat ratio are difficult to sell
- the most sought selling weight falls between 80 and 100 kg; beyond this margin, the price goes down. Pig weight therefore plays a significant role in fixing the price
- all estimates are based on live pigs.

The selling price ranges from VND 14,500 to 16,500 per kg live weight, with the overall weight falling between 80 and 100 kg. The carcass sells for between VND 21 thousand and 22 thousand per kg. In brief, initial transaction is dependent on ad hoc negotiations; it is not regulated by any prior agreement. All transactions are done on an individual basis. Not even VISSAN receives its pig supplies on agreement-based relations. There is no sanitary and quality control during initial transaction. And, lastly, there are no differences in taxes imposed by State agents on activities for different operators concerned.

Transactions between the wholesaler and local collectors ensure the transportation of pigs from other provinces and the central areas of the country to Ho Chi Minh City. Pig evaluation is based on physical appearance, health status of the animal etc., which are the same standards as observed at Haiphong. Delivery is organised through oral commitment, and information is exchanged by telephone.

The quality of the pigs originating from the central and northern parts of the country is considered inferior to that of pigs in the south; the price is about VND 13 thousand per kg (60 kg live weight), while carcasses cost VND 18 thousand per kg. The live animal is used as the basis for pig evaluation.

Ho Chi Minh City slaughterhouses are better organised than those in Hanoi and Haiphong. Slaughtering follows a co-ordinated work chain, and the abattoir space is divided by function: bleeding, hair removal, gutting, primary cutting and sanitary control. A veterinarian (or two in the case of large slaughterhouses) from the city's Veterinary Department carries out sanitary control.

Abattoir charges and taxes consist of: VND 7000 for slaughtering fee; VND 5000 for electricity, slaughterhouse space, charcoal etc.; VND 1000 for pig washing prior to slaughtering; VND 4000 for sanitary control; and VND 2000 for transporting carcass to the market.

The collectors may or may not ensure the slaughter of their pigs, depending on the abattoir. They collect their animals in batches, like the wholesale collectors that operate in Haiphong. The negotiation about the carcass price between collector and retailer is based on the live pig with price adjustments after slaughter as practised in Haiphong.

The number of pigs slaughtered in an abattoir ranges from 50 to 100 per day. The quality of carcasses delivered from slaughterhouses is differentiated as follows:

- pigs from the central areas: net weight of around 45 kg; lard thickness: 18–20 mm measured from a point after the last rib; lard thickness beneath the sirloin: 20–22 mm

- locally produced pigs: net weight of around 70 kg; lard thickness 18 mm, measured from a point after the last rib; lard thickness beneath the sirloin: 20–22 mm.

Slaughterhouses in other areas such as Can Tho as well as in the countryside were also visited and it was observed that slaughterhouse structures are identical to those in the Red River Delta.

Once the slaughterhouse has delivered the carcass, price negotiation between the collector and the retailer is based on weight, physique and sanitary status of the live pig. Prices may or may not be adjusted after examining the carcass.

The VISSAN Company delivers the carcasses to retailers for a standard initial price. However, depending on the condition of the pigs, this initial price is subsequently adjusted by the retailers. The selling price is fixed for the carcass, but generally, there are no objective criteria for evaluating pig carcasses.

The primary and secondary cutting of carcasses is carried out in the market. Primary cutting entails separation of pieces of the carcass, while secondary cutting involves separation of tissue types such as lean meat, fat etc. The primary cutting at Ho Chi Minh City clearly determines the meat parts on offer: lean ham, steak, breast, ham, knuckle of ham without bone, sirloin and others. Combined meat types (fatty meat and lean meat) are hardly sold. Ham must contain very little fat level (i.e. below 5 mm).

Pigs from the North and Central regions are marketed in the suburbs of the city under very clean conditions. An area of the market is reserved for the sale of pork. Marketing conditions are much better than those in the city of Hanoi and should be copied. The meat sale outside the cities of the South has the same characteristics as in the countryside of the North.

The purchase of protein-rich animal or vegetable foods (mainly pork, chicken, fish, bean curd or tofu, peanuts but very little milk products) amounts to a total of about 100 kg/person per year in cities, and between 50 and 60 kg/person per year in rural areas. A household survey suggested that pork represents 30 to 50% of the purchases. The average quantity bought per family per day is 300–500 g of lean meat and 500 g to 1 kg for other kinds of meat and bone.

High-quality meat is defined by the following criteria:

- colour: clear red
- tender, humid (surface not dry)
- white fat
- low level of intra-muscular fat
- soft, thin skin
- clear skin colour without abnormal blemishes
- pork taste (less marked than previously)
- bland odour.

The quality of the retailer shop is rated based on the following criteria:

- seller: good appearance, tidiness
- venue of sale: in the market (where pigs are subject to sanitary control)
- height of sale counter: above one metre

- surface of counter: metal sheet
- meat packaging: paper, magazine, cellophane (nylon) bag. Buyers are unaware of the sanitation and health problems related to the use of papers such as school pupils' exercise books or newspapers for packaging.

3.8 Marketing margins

A marketing margin is the difference between the revenues from the sale of products and the cost incurred in running the market operation. These costs include the cost of procuring the product, labour and non-labour costs.

An analysis of price margins among 16 different markets all over the country over the period from 1994–98 revealed that price margins are relatively high and do not show convergence between regions (IFPRI–MARD 2001). The analysis of regional price margins for different types of meat provides an indirect challenge for market integration. The results indicate that there is no tendency for regional prices to converge. For some regions, there are indications of a divergence of prices, as in the case of chicken live weight in the Northern and Central regions and beef topside prices for the Central region. Margins are highest in the case of pigs, and lowest for poultry (chickens and ducks).

Traders have higher average margins than wholesalers and retailers (Table 11). Although retailers have the lowest absolute margins, retailers' margins are the highest in terms of percentage of sales value (5.82%).

Table 11. Average marketer costs and margin levels by marketer type across species (VND $\times 10^3$).

Business type	Procurement value	Total cost	Sales value	Margins	Margin as percentage of sales value
Trader	1,798,494	52,252	1,931,675	80,919	4.19
Wholesaler	1,696,765	51,566	1,807,308	58,630	3.24
Retailer	361,348	9,562	393,836	22,926	5.82

Source: IFPRI–MARD (2001).

Table 12 shows the average margins by specialisation and marketer type. The pig traders, wholesalers and retailers had the highest average absolute margins compared to the other animal categories. In terms of percentages of sales values, cattle traders and retailers had the highest average margins. On the other hand, duck wholesalers had the highest average wholesaler margins as proportion of sales.

Table 12. Average margins by specialisation and marketer type (VND $\times 10^3$).

Business type	Pig marketer	Chicken marketer	Duck marketer	Cattle–buffalo marketer	Multi product
Traders	117,548 (3.91)*	23,652 (3.95)	22,305 (5.69)	73,792 (6.25)	18,703 (3.65)

Wholesalers	86,897 (3.36)	10,491 (2.00)	22,630 (3.94)	31,360 (3.01)	–
Retailers	26,099 (5.96)	16,299 (5.36)	11,057 (4.12)	23,975 (8.53)	–

* Figures in parentheses represent the margins as a percentage of total sales value.
Source: IFPRI–MARD (2001).

3.9 Trade flow patterns

3.9.1 Domestic trade

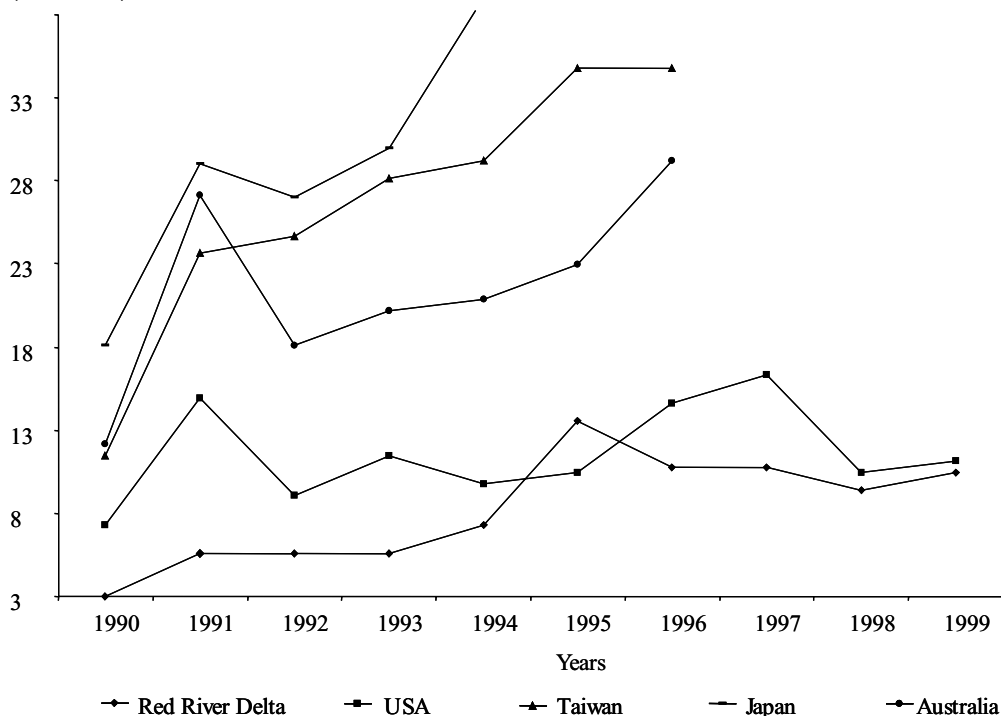
Most of the trade takes place locally, with most farmers selling at the farm gate, as they do not have access to organised markets and auctioning systems. As a result, information about markets, prices and other supporting information are limited. The lack of a widespread system of organised live animal markets in Vietnam means that the majority of marketing and distribution of live animals and animal products is undertaken through a network of marketers operating in informal groupings and often undertaking exchanges on a face to face basis. Traders tend to be the link in the marketing chain transporting the product from the farm-gate over the longest distance. The development of the marketing system in the previous ten years has created many steps between production and the end consumers of livestock products. This is specifically illustrated by an example of the marketing channel for pigs in the Mekong River Delta.

A study of marketing transactions that prevail in the Mekong River Delta showed that live pigs that are produced in North and Central Vietnam and other areas are generally sold to collectors who then sell them to traders in these areas. These traders then bring the pigs to be sold to traders in Ho Chi Minh City. Once there, the pigs are brought to the slaughterhouses, and carcasses from the slaughterhouses are sold to retailers of fresh meat, who then sell to restaurants and/or processors, as well as to final consumers.

3.9.2 Opportunities for export

Pig exporters are facing a number of difficulties, the main reason being that the price of meat in the domestic market has increased rapidly. For example, in the Red River Delta, the live weight price for pigs was VND 8000 per kg in 2001 and this increased to VND 14 thousand per kg in 2002, a 75% rise. The live weight price in the Central Region, on the other hand, was VND 15–16 thousand per kg while that in Ho Chi Minh City was VND 18 thousand per kg. Meanwhile the export price of meat has greatly declined from US\$ 1.7 to 0.8 per kg. In general, the export price for pigs has declined by 50% in the world market, which is a problem since the price of pork in Vietnam is the highest among pork exporting countries. For example, the price of pork in Ho Chi Minh City was about VND 17–18 million per tonne (US\$ 1116/t); whereas

Farmer's price of live pig
per kg live weight
(VND × 10³)



Source: CIRAD-VASI/Ecopol project (2000).

Figure 9. Farm-gate price of live pig in Red River Delta and some countries around the world, 1990–99.

the price of equivalent quality meat in Russia was US\$ 1070/t and only US\$ 868/t in the United States. Thus, for every tonne of exported meat at these prices, Vietnam incurs losses of about VND 3 million, or roughly US\$ 200.

Vietnam exports tens of thousands of tonnes of pork a year while poultry is not exported at all. It is recognised that the export market does not significantly influence the production of pig and poultry in the country, for the simple reason that the export volume has been relatively low in comparison with the demand on the domestic market.

As can be seen from Figure 9, comparing the farm gate price of pigs in Vietnam and in other countries of the world, the Vietnamese price is lower than that in Australia, Japan, and Taiwan and is very close to that in the United States. However, one disadvantage of Vietnam is that the carcasses produced are of lower quality than in the other countries when measured by internationally recognised quality and safety standards. This makes it difficult for Vietnamese meat to compete in the world market, and even in the domestic market in the near future.

4 Constraints to output/input markets

4.1 Factors affecting market participation: Output markets

4.1.1 Meat quality and safety

Quality requirements between rural and urban areas differ. Vu Trong Binh and Bui Thi Thai (2001) indicated that about 86% of households in urban areas prefer to buy high quality meat despite the relatively higher price, while about 54% prefer vegetable oil than pig fat. This makes it difficult to sell pigs with high fat ratios in larger cities. The meat quality demanded in rural areas is comparatively lower. While pig fat continues to be widely used, there has been a gradual replacement of pig fat with vegetable oil. In general, consumers in urban areas are willing to pay a premium of about 6 to 16% above the regular price, if they can be sure of receiving clean and safe products.

While demand for meat has been rapidly increasing, the shift in demand towards high quality products has likewise become more apparent. The increased demand for product quality has far exceeded Vietnam's ability to supply. This is largely due to the dispersion in the distribution of various actors in the commodity chain, which only allows loose monitoring, not to mention the fact that the commodity chain would benefit from a more professional set up. Producers and processors, while aware of the demand for high lean meat ratios, do not pay particular attention to the hygiene and sanitary conditions of their products because of the lack of product certification and labelling that would give a premium to products that conform to accepted levels of safety and quality standards. Moreover, there is no mechanism in place (or if there is, the implementation appears to be very loose) within Vietnam that closely monitors the adherence to quality and safety standards by producers and processors. Especially for small producers there is no incentive to produce high quality products because the additional effort and cost involved are not compensated by the potential price they would receive in the market. That is, they are not guaranteed a premium for producing good quality pigs because of the limited number of animals that they can bring to the market.

There are two different quality standards that pose barriers to Vietnamese pig producers, namely the quality of technology and the quality of hygiene being practised in production. The technology used by many smallholders results in low-quality meat and is generally only adapted to small-scale operation. There is a wide variation in practices and there is no standard procedures applied. Given this, the output produced commonly has low lean meat ratios and low carcass quality. In addition, meat-processing factories usually have difficulties sorting out low vs. high quality meat for lack of predetermined standards. Hygiene is not closely monitored from the production unit to the retail chain and this may become a critical factor for consumers to develop a preference for imported meat with guaranteed quality. This is most likely to happen in urban areas where consumers are more willing to pay a premium for safe

products. Vietnamese pig meat has also encountered some difficulties in meeting quality control standards demanded by importing countries.

4.1.2 Legal framework and standards

At present, the government applies no clear standards for the transport of animals and for slaughterhouses, among others. Private or government agents engaged in various activities in this field pay very little attention to the quality standards that are supposed to be met. As observed in the abattoir in Hanoi, for example, no specific set of standards are being followed for ensuring the hygiene of the processed meat, nor is there a clear, legal definition of what constitutes an abattoir, including where it should be built and under which conditions it should be operated. The lack of clarity in existing government regulations in this field contributes to making the situation disorderly and hence very difficult to attribute accountability to specific entities in cases of epidemics or grave public health hazards. Moreover, when the distribution channel is poorly organised, the agents are likely to operate independently and without regard for regulations pertaining to slaughter and product quality. This has implications on farmers' motivation to produce quality pigs because in the absence of strict quality monitoring, quality is not given a premium it deserves in the market price. Furthermore, consumers will not be prepared to pay for quality if quality differences across products are not discernible. The prevailing conditions in production and marketing will most likely reduce the competitiveness of the marketing chain for pigs and poultry and any other livestock particularly in urban and export markets where these issues are becoming more important.

4.1.3 Bottlenecks in the distribution channel

The marketing distribution channels in Vietnam have always been facing problems beset with inefficient flow of information. This is partly attributable to the bad state of infrastructure across the country, particularly in the rural areas, as well as the unorganised state of the marketing system in the country. There also exists a regional fragmentation of markets, especially between those of the North and the South. This could arise from physical constraints (more apparent), or could be a consequence of institutional factors (less obvious). Previous discussions have indicated that this is also evident in the lack of convergence of prices in these two major regions. But even at the district level within a province, it is common to find a disconnected market system. This situation has implications on the commodity flows and on commodity prices. When small livestock farmers have limited opportunities to sell their marketable surplus in an efficient and profitable manner, this creates a deadweight loss to society. For one, it limits the quantity of output available to consumers, and hence increases

the price, thus making consumers worse off as they pay more for a given quantity purchased than what otherwise would be the case.

At the other end of the equation is the limited income that the producer can derive from this activity for lack of access to 'efficient' markets; that is, farmer income is lower than what it could have been had he been able to sell his product. At present, the system of roads in Vietnam is largely built with foreign loans that need to be repaid, and the cost of building this infrastructure is being passed on to the commuters in terms of toll fees. This increases the cost of commuting across the country. There is essentially a trade off between efficiency (in terms of good roads and better transport facilities) and the cost of that efficiency (in terms of added transportation cost) and a balance between the two will need to be established. At present, there is a perception among the Vietnamese population that these additional fees are increasing the cost of product flow along the commodity chain. Much of these costs actually arise from informal rent seeking activities. For example, according to a DANIDA-funded project survey conducted by IFPRI-MARD (2001), about 20–30% of traders indicated that the police poses a major barrier to market access because of the illegal fees that they require traders to pay for letting them pass through irregular routes. Moreover, almost 70% of traders indicated that the police are a major barrier to their trading activity.

4.1.4 Limited access to information

Traders generally supply the smallholder farmers with information about markets and prices. The government information network is not organised in a systematic manner with overlaps between and across various government agencies. Therefore, government institutions have not been supplying the kind of information that farmers can use in their marketing activities. In addition, information is not available in a timely manner; whatever type of information eventually reaches the farmers and other agents in the commodity chain is either outdated or not useful at all. Because of the fragmentation of the marketing system in the country, there exists a great variation in prices. Without timely information as a basis for marketing decisions, farmers usually are at the losing end of the bargaining process vis-à-vis traders and other agents who have more information due to their exposure to a wider geographic area and larger number of market players. Furthermore, with limited information, smallholder farmers do not know where and to whom to sell their animals and so be able to obtain a fair price. Given this, farmers have less incentive to raise animals that are targeted to a specific market where they would expect to obtain a fair economic return for the value of their output. There is thus limited scope for price differentiation as the farmer is faced with an imprecise market.

4.2 Factors affecting market participation: Input markets

4.2.1 Quality and price of animal feed

An IFPRI–MARD (2001) study found that good quality animal feeds have relatively high prices compared to inferior quality feeds. Animal feeds that are produced by private local feed companies are generally perceived to be of lower quality than those produced by foreign-owned feed milling companies. However, with very loose regulations for labelling and product quality certification it is very difficult to differentiate between low vs. high quality feeds being retailed in the market. Consequently, farmers' decisions on feed purchase are largely driven by the price. This choice has implications on the quality of animals produced because feed quality is highly correlated with meat quality. Even under these circumstances, farmers consider that the prevailing prices of animal feeds are generally too high notwithstanding the level of quality of these feeds. The high prices can be attributed to high costs of raw materials for these feeds, namely, maize and soybean, among others.

Compared to world market prices, prices in Vietnam are higher and the price difference is largely a result of the government's protectionist policy for agricultural products. Specifically, high import taxes are imposed on imported raw materials in order to protect local production of these commodities. On the other hand, animal feed manufacturing companies are given permission to import these raw materials at lower costs (i.e. minus the import taxes). This prevents smaller local companies from competing with these big firms in terms of cost-efficiency since the former do not have access to preferential import prices for raw materials for animal feeds. As a result, local companies will compromise on product quality in order to obtain the highest margin from the sale of their product. Unless something is done to correct this cycle, this behaviour will perpetuate the low-quality feed–low-quality meat cycle that undermines the competitiveness of the smallholder livestock sector and prevent farmers from becoming important players in the emerging markets for good quality products.

4.2.2 Quality and price of animal breeds

The genetic quality of the animals that are accessible to small farmers is questionable because animals are usually obtained from private breeding operators who are not subject to government or any other regulation. As a result, they are not particularly concerned about the quality of their animals. The majority of these private breeding operators, however, have the technical knowledge to fully maximise the potential productivity levels of the breeds that they are raising. Government breeding centres, on the other hand, are generally operating inefficiently, with production costs being so high that they have difficulties in producing quality stock at prices affordable by small farm operators.

4.2.3 Livestock services and inputs

While the supply of veterinary medicines and vaccines is often not a major constraint, price and quality factors may impede their effective use. Weak field level institutions that are generally under-resourced, with inadequately trained staff, and poor data collection, storage and retrieval systems, erode a reasonable legislative and regulatory base for disease management. The supply of veterinary services has in some cases weakened and become ineffective because of the devolution of functions from the central to the local government units. This limits the effectiveness of veterinary and extension services to provide the necessary inputs to animal production by smallholder farmers. The consequence is low productivity because of animal health and management problems.

4.2.4 Transaction costs

The predominantly small-scale operations and the wide dispersion of production units contribute to increasing costs of collection, selection and classification, resulting in higher transaction costs along the commodity chain. In addition, the high risk of getting poor quality pigs from various sources with uncertain product quality, adds to the costs in terms of moral hazard. Specifically, when buying pigs from uncertified sources, the uncertainty about product quality is imposing a 'tax' on the value of the good, in that the potential buyer will be reluctant to pay the market price for a pig of acceptable quality, thus generating a loss in potential income to the farmer-producer. Hence, there are two levels of transaction costs that are critical in the commodity chain. The more obvious ones are the costs incurred from inefficiencies and multi-layer marketing channels. These are illustrated in the results of the VASI study on pig marketing in the Red River Delta. The selling price was estimated to increase by about 20% on average from the farm to market under existing market channels (Table 13).

Marketing costs comprise the largest component of transaction costs incurred from the farm gate to the consumers. Because of the structure of the prevailing marketing system for livestock products in Vietnam with many different stages from production to consumption, the cost of moving the commodities along this chain rises. Studies on the marketing of agricultural crops for livestock feeds such as maize in the North-West and rice in the South indicate that the increase in price amounted to about VND 50 to 100 per kg of the commodity from the farm-wholesalers and/or retailers-final consumers. A study of the marketing of feed supplements from Hanoi to Hai Duong and from Hai Duong to the districts and communes showed that the marketing costs increased by 306%, and 10–15%, respectively. Mixed feeds, on the other hand, are usually distributed by large companies through different types of agents. CP and Proconco, for example, have classified their agents into 1st, 2nd, 3rd grade and so on, and each of these grade levels receive a corresponding percent share of the value of feeds that they

can manage to sell. These agents are authorised to impose a mark-up on their prices as payment for their distribution services. The mark-up ranges from 1–3% depending on the agents' classification. These additional costs are passed on to the farmers who buy these feeds.

Table 13. Variations in the price of pork from production to consumption, comparing the same pig genotype (F₁ Domestic × Foreign).

Locations	Producer price (VND/kg) live weight	Retail price (VND/kg) live weight	Proportional price increase (%)	Producer price as proportion of retail price (%)
Long An–Ho Chi Minh	12,000	15,511	31.8	75.9
Suburb of Ho Chi Minh–Ho Chi Minh	13,000	16,990	30.6	76.5
North East South	14,356	16,025	11.6	89.6
Red River Delta	10,021	10,319	3	97.1
Nam Dinh	8480	9180	8.3	92.4
Ha Tay	9265	10,021	8.2	92.5
Nam Thanh	9000	10,737	19.3	83.8
Nam Thanh–Hai Phong	9000	11,320	25.8	79.5
Nam Thanh–Hai Phong	9500	12,287	29.3	77.3
Ha Tay–Hanoi	9265	11,043	19.2	83.9
Nam Dinh–Hanoi	8480	10,371	22.3	81.8
North–Ho Chi Minh	9000	16,990	88.8	53

Sources: Le Goulven (1997); Vu Trong Binh et al. (2000); CIRAD–VASI/Ecopol project (2000). Summary by Dao The Tuan, personal communication.

5 Role of policy in addressing constraints

A recent policy statement from MARD said that it expects an increase in earnings from agriculture, forestry and fisheries by 2010. In order to achieve this, the agricultural sector should grow produce to meet market demands, and this can only be done when farmers modernise production to increase product value and productivity. Vietnamese farmers' living standards remain very low despite government efforts to improve production and infrastructure in the rural areas. The failure to improve farmers' living standards can be attributed to the many constraints they face, among which are the limited land availability (average agricultural land per capita is about 0.1 ha) related to the high population density, and the low competitiveness of their produce due to poor quality and productivity. An investment strategy that is capable of connecting the farmers with processors and markets is also missing.

The livestock sector in Vietnam has received little budgetary support and little regulation regarding marketing, health and the environment. This is most apparent in the case of animal health, condition and location of the slaughtering/processing industry. Even though there are limited policy induced distortions in production, marketing and feed industry, the government has apparently directed its effort more towards production and commercial activities rather than in regulatory, capacity building and research and extension activities. Only when attention is directed at these latter aspects of development will the constraints be minimised. While the sector has grown relatively well in the past despite the minimal role played by the government, this does not suggest that it will remain to be the best policy for the sector. The government should instead focus on providing the public goods that are currently being undersupplied and the private sector should be left to undertaking commercial activities.

Recent policy reforms in the country, notably the shift from collective management systems towards more individual, private action as indicated in Resolution N100, has certainly affected the way business is being conducted at the farm level. It has resulted in strong agricultural growth in the 1980s. Subsequent reforms embodied in Resolution N10 strengthened the autonomy of farm households in the conduct of agricultural production activities, including livestock. The current policy towards diversification of Vietnam's agricultural production has likewise provided impetus for the expansion of livestock production in the country. However, this development has also brought with it some problems that have direct impacts on smallholder production especially regarding investment priorities. With the government's apparent tendency to provide more investment incentives towards the development of commercial production especially in breeding for the export market, an unintended bias against the development of the smallholder producers has been created. This bias has been manifested in the various constraints that are identified and discussed in the previous sections. While some constraints have been the result of external factors to which Vietnam has become more susceptible because of the opening up of its economy, it is recognised that existing policies and institutions within the country have exacerbated

some of these constraints. It is noteworthy, however, that within the Ministry of Agriculture, the awareness of these constraints is growing and new development programmes and policies targeted to develop the livestock sector are being implemented.

6 Examples of interventions that address barriers to markets

Though the government has various programmes in place that are aimed at stimulating livestock development through extension for improving meat quality and animal productivity, in many cases the results obtained have not been as successful as expected. A number of examples from the various projects that have been undertaken in Vietnam are presented as follows.

In 1990, VASI initiated a household-level pig-breeding project that focussed on breeding improved pig breeds in Yen So (Ha Noi). Previous experience had been concentrated on large-scale breeding programmes involving major investments in materials and technical skills provided by experts. The project, unfortunately did not successfully achieve its objectives after two years because of a number of institutional defects in the implementation in addition to other constraints beyond the control of the farmer.

These include:

- the overall focus on just the technical aspects of production without considering the potentially important role of market incentives
- the high risk of diseases and the limited capacity of farmers to adequately cope with nor respond to these risks and
- the lack of resources to sustain the relatively high cost of production, and the lack of adequate field testing of the technologies to validate results on station.

Similarly in 1990, the Hai Duong Science Committee (now, Hai Duong Science, Technology and Environment Department) in co-operation with VASI distributed pigs with a three-quarter share of foreign genes to smallholder farmers for breeding purposes in Hong lac commune, Thanh ha district. However, after termination of this experiment, farmers shifted back to breeding crossbred F₁ pigs as before.

Together with the distribution of pigs with a high proportion of foreign blood in 1999, Hai Duong province started a programme of distributing exotic sows for breeding purposes. Hundreds of exotic sows were obtained by Hai Duong province for Nam hung commune, Nam sach district. Assistance in supplying the feed for these animals was also provided. One year later, in 2000, however, there were only 20 exotic sows left, supply- ing piglets to newly formed livestock groups with the support of the Red River pro- gramme of VASI. Factors that made the above programmes unsustainable include the strong focus on the technical aspects of breeding, and the concomitant lack of attention on factors such as knowledge and skills in marketing (Bui Thi Thai et al. 1999).

Ha Tay is one of several provinces that introduced new technologies in pig production and obtained good results from their application. Through co-operation and exchange of knowledge and expertise with the Department of Rural and Agricultural Development and with the breeding companies, positive results have been achieved. Since 1993, Ha Tay has become one of the major pig exporting provinces, producing

large numbers of piglets. One farm became second only after Hai Phong as it exported more than 1000 t pig meat in 2001. Overall, the North exported 10 thousand tonnes.

Many communes became main points within the province for the breeding programme. The breeding programme was targeted for improved pig meat. To achieve this, the province and districts co-operated with the research institutes to support the dissemination of livestock technology to smallholder farmers. The investment contributions included capital (about VND 33 million) for upgrading local breeds and developing pigs with a high proportion of lean meat. Every year, Ha Tay province also invests millions for developing pigs with a high proportion of lean meat. However, this investment was not sufficient to develop breeding farms to breed grandparent stock. This will require still more investments. Apart from the assistance in supplying breeds and in building pigpens, provincial units of MARD and the district bureaux also assigned personnel to provide assistance in livestock and veterinary technologies for small farmers.³

Despite the many efforts and very large investments, the results from exotic pig breeding in Ha Tay are still limited. The models of exotic pig breeding have not yet multiplied and expanded to a wider scale as they have had mixed results so far. However, in Trung Chau commune, some smallholder households have managed to breed thousands of piglets per household per year for export. Other households breed some sows that are producing piglets supplied to these families. It can therefore be concluded that the target of the project has not been achieved, because the exotic pig strain has not been widely adopted into household production to increase domestic meat supply. In other districts such as Quoc Oai there were households who were already breeding exotic sows and were organised in livestock associations composed of 10 persons.

The experiences of the above mentioned projects indicate that while improved pig breeds have been introduced, the efforts were largely targeted to the production of pigs for export and not for increased production for the domestic market. The production models that have been applied have so far been able to exist only because of the large support they receive. It is questionable whether these models could be sustained without the subsidies from the projects.

In the case of poultry, breeding of exotic strains has been mainly developed in the big farms. Small farms have proved to be ineffective in these projects. In some regions, new poultry strains such as: Super meat duck C.V, Super M, were imported into Vietnam in 1989 within the framework of the project on 'research and development of duck raising – VIE 86/007' that was supported by the United Nations Development Programme (UNDP). In 1993, this duck strain was adopted very widely and currently there are up to 75 thousand female ducks in the country. Besides, there are also projects that provide specific chicken strains and dual-purpose chicken breeds for production in many regions of the country.

3 According to information from Mr Duc, Vice-Director of Ha Tay Department of Agriculture and Rural Development.

In summary, the government-owned projects in the past have had some impact but have not been entirely successful. The main factors for the limited success include the following:

- The exotic breeds require conditions that are much more demanding than those for the locally produced pig breeds. The requirements concerning hygiene, diets, breeding facilities, prevention and elimination of epidemics and diseases of exotic breeds are often beyond the ability of most smallholders. The shift from keeping traditional strains to keeping exotic strains requires a learning process and experience. Many smallholders were not prepared thoroughly and many projects had no suitable training and extension methods to ensure this.
- Keeping highly productive strains in present conditions requires making considerable investments; otherwise, the cost of production will increase substantially. Most of the available technologies are based on a thorough knowledge of the biology of pigs but have not been fully tested at the household level. There is thus a need to undertake a test under varying conditions to validate their applicability outside the research station. But up to now, it is very rare for research institutes to undertake experiments of this kind. The research institutes often base their technical guidelines on results from experimental stations, so that the extension service officers have difficulties in providing suitable advice and recommendations to smallholders.
- The scale of smallholder breeding is still small and there is no integration among these small-scale production units. Thus, when exotic breeds are introduced, the new investments often increase the production cost substantially. On the other hand, although the quality of the product is higher, only a few smallholders are able to engage in this production activity, and thus it is very difficult for them to bargain for a good selling price based on the higher quality of their product due to the limited number of animals being supplied. The collectors incur more time to collect a sizeable number of good quality animals, so that the expenses for collecting rise and the prices offered to farmers fall. Given these conditions, there is very little incentive for smallholders to improve product quality through the adoption of improved or exotic strains.

7 Potential areas for research and development

At present, the Vietnamese Government pays special attention to investment policies in order to overcome output shortages of livestock products. The following issues have been identified as important:

- more attention should be given to studying smallholder organisations as a pathway for addressing issues of output marketing. This is important and should be the main feature of any livestock development strategy. It could help smallholders to more easily link up in production and to access markets
- there should be a well-defined standard for slaughterhouses and meat processors. These standards should be enforced with penalties for violators. The government should define the standards suitable for every stage of the production process, and avoid adopting standards that may prove unsuitable to existing conditions within the country
- the government should encourage the formation of associations of slaughterhouse operators and of traders. This should facilitate private investment for upgrading the quality of slaughterhouses and avoid the dependency on public investment
- encouragement of investments for establishing more processing factories, both for supplying the domestic and export markets. It is also worthwhile looking into a more diversified processing approach, in order to add value to meat and other livestock products. Market niches for these products should then be identified and developed and
- encourage the use of labels to signal product quality. The government will need to set standards for product labelling and certification.

To improve the input markets for livestock production, the following issues need to be considered:

- the government will need to strengthen the breeding system and work with private companies to ensure the availability of highly productive breeds to smallholder producers. Moreover, it would be advisable to replicate these breeding schemes at the household or small farm level within the local area in order to reduce the costs that are currently being incurred at government breeding centres. This will ensure that smallholders are able to obtain the exotic breeds more easily and at affordable prices
- feed processors will need to be encouraged to provide more information about the quality of their products. It is, therefore, necessary to set up a framework that will govern the monitoring and quality control system. An example would be regular random sampling of products from these processing companies in order to ensure their safety. A regulatory body will need to be set up and given adequate legal authority to impose these regulations

- it is necessary to develop the domestic production of maize, soybean and fishmeal whenever the country has a comparative advantage for doing so. Apart from that, taxes on imported feeds should be eliminated to minimise the bias towards big companies that are exempted from these taxes. The quota policy now allows the animal feed companies to be subjected to a low tax rate, which is not accessible to small producers
- it is necessary to help small farmers to form groups and co-operatives in order to reduce the input costs through collective action (to buy feed together, to access the veterinary services etc.). These organisations will be the agents of the government offices, the extension services, among others, and small farmers' organisations will protect members against competitors
- it is necessary to establish a legal framework for organising private veterinary associations. These will have the task to manage the private veterinary practitioners, train and develop the veterinary bases, and to help the private veterinary associations to take part in the prevention of animal diseases through contracts with livestock groups, farms and the government. It is also necessary to separate the role of the government in the veterinary management from that in the prevention and protection against epidemics and other animal diseases
- the government will need to foster the formation of small-scale farmers' associations and/or co-operatives, so that they can take part in the market and be able to compete with the big domestic and foreign farms. This important policy and development strategy will avoid the negative consequences of large-scale livestock development. The government investment should be concentrated on supporting these co-operatives and associations in order to stimulate their development
- the financial sector should establish preferential lending rates for small producers' associations. The government, on the other hand, should establish the land policy for livestock co-operatives so that they can build animal housing (sheds, pigpens etc.) in areas suitable for these activities or provide areas for grazing without engendering negative externalities such as environmental pollution
- the government may need to revise existing laws on co-operatives in order to provide more flexibility to interested parties to establish these co-operatives and associations. This will provide legal personality to these organisations. Under the current set up, the requirement for co-operatives to own capital has been a major constraint to the formation of legal co-operatives by smallholder farmers. The government should also look at the option of changing the perspective in the co-operative law in order that the co-operative shifts from being a trade unit into a co-ordinated unit of the households' collective activities and
- it is necessary to consolidate and subsidise the artificial insemination stations at district level, especially in the poor districts that are not able to sustain the operations of these stations.

The following research and development questions are identified as relevant to Vietnam's situation in the coming years:

- studying the production organisation. It is necessary to develop new production models for smallholder producers that will reduce costs, increase product quality and competitiveness. These models should be consistent with the livestock development objectives, as well as with rural development
- identifying ways in which smallholder production may be made more efficient through capacity building and enhance skills not just in production activities, but also in organisation, management, marketing and resource mobilisation, among others
- studying the commodity chain and understanding the prevailing organisation and transaction costs incurred along the distribution channels in order to identify and develop new models that will lead to quality enhancement from production to consumption, and ensure the effective and sustainable integration of various players within the system
- building local capacity for livestock production and development activities, in order to improve training for smallholders, and effective dissemination of development models under varying conditions
- developing analytical models that will link production, processing and consumption
- investigating options for product labelling and certification that are suitable to smallholder farmers conditions
- studying institutional policies that have direct impacts on the livestock commodity chain and prescribing options to improve the participation of smallholders in this commodity chain and
- studying and defining the optimal size of production, collection, processing and slaughter where economies of scale may be important.

8 Summary and conclusion

This study provides a comprehensive view of the development of the livestock sector in Vietnam. It also identifies barriers to livestock input and output markets for smallholder producers. Specifically, constraints to livestock input markets in the country include the uncertain quality and high prices of animal feeds including raw materials for feed processing, variable quality and high cost of more productive animal breeds, as well as inefficient delivery of veterinary services and high cost of veterinary inputs. Constraints to reaching output markets include poor quality and unsafe meat, lack of legal frameworks and standards, bottlenecks in the distribution channel and limited access to information. In addition, the prevailing marketing system and channels for each type of commodity from farm to market have evolved into a multi-stage system that is characterised by high transaction costs and lack of integration among the players in the various channels. The lack of an organised marketing system for livestock in Vietnam does not provide an enabling environment that will encourage producers to improve production activities for lack of some basis for comparison. In addition, it also perpetuates the low market power of producers relative to other players such as the traders and wholesalers.

It is envisioned that the government could play a regulatory role in ensuring that standards and regulations to produce high quality, safe meat and meat products are enforced and sustainable. Moreover, research into the development of alternative production models that are suitable to smallholder producers and at the same time capable of generating high quality, safe meat and meat products would be important in engendering more smallholder participation in emerging markets for livestock. Collective action to take advantage of economies of scale in input procurement as well as output marketing could potentially be developed and tested for replication on a wider scale. Government support for these initiatives would certainly be desirable.

Vietnam is on the verge of transition from a mono-crop economy to one that is more diversified, and the livestock sector is becoming one of the key players in this transition process. In laying out the priorities for the development of the sector, an important point to consider is the extent to which smallholder producers are being involved in the development process instead of gradually being marginalised through inappropriate institutions and policies. In addition, it is important to note that a huge impetus of this development process should be anchored on the rapidly growing domestic market and the changing nature of its demand. The export market has huge potentials but in the near term it is the domestic market that will be driving the growth of the sector. Targeting the export market will have to become a long-term objective, after the conditions of the domestic market will have improved and set the stage for a more broad-based growth of the sector.

References

- Castella J.C. and Quang D.D. (eds). 2002. Doi moi in the mountains: Land use changes and farmers' livelihood strategies in Bac Kan Province, Vietnam. The Agricultural Publishing House, Hanoi, Vietnam. 283 pp.
- CIRAD–VASI (Centre de coopération internationale en recherche agronomique pour le développement–Vietnam Agricultural Science Institute)/Ecopol project. 2000. Description of the system studied, Part A. Results of Phase 1. CIRAD in collaboration with Ecopol, ViÕn KHKTNN, Hanoi, Vietnam. 28 tr. CIRAD, Paris, France, and VASI, Hanoi, Vietnam.
- Dao The Anh. 2003. Reformes socio-economiques et adaptation des choix d'activite des menages ruraux dans le Delta du Fleuve Rouge au Viêt-nam. PhD thesis. ENSAM (Ecole Nationale Supérieure d'Arts et Métiers), Paris, France.
- Delgado C., Rosegrant M., Steinfeld H., Ehui S. and Courbois C. 1999. Livestock to 2020: The next food revolution. Food, Agriculture and the Environment Discussion Paper 28. IFPRI (International Food Policy Research Institute), Washington, DC, USA, FAO (Food and Agriculture Organization of the United Nations), Rome, Italy, and ILRI (International Livestock Research Institute) Nairobi, Kenya. 72 pp.
- Frio A. and Gray D. (eds). 2002. Research and development strategies for the livestock sector in South-East Asia through national and international partnerships: Proceedings of the workshop held in Bangkok, Thailand, 11–15 March 2002. ILRI (International Livestock Research Institute), Nairobi, Kenya. 286 pp.
- General Statistics Office of Vietnam. (various years). Statistical yearbooks. Hanoi, Vietnam.
- IFPRI–MARD (International Food Policy Research Institute–Ministry of Agriculture and Rural Development of Vietnam). 2001. Policy options for using livestock to promote rural income diversification and growth in Vietnam. MARD, Hanoi, Vietnam, and IFPRI, Washington, DC, USA.
- Kerkvliet B.J. and Porter D.J. (eds). 1995. Vietnam's rural transformation. Westview Press, Boulder, Colorado, USA. 236 pp.
- Le Goulven K. 1997. Les formes de coordination de la filière de viande de porcs dan le Delta du Fleuve Rouge. INRA/ESR, Montpellier, France. 110 pp.
- MARD (Ministry of Agriculture and Rural Development). 2000. Agricultural Sector Support Program: Vietnam Small Livestock. MARD, Hanoi, Vietnam.
- Minot N. and Goletti F. 2000. Rice market liberalization and poverty in Vietnam. Research Report 114. IFPRI (International Food Policy Research Institute), Washington, DC, USA. 129 pp.
- Minot N. and Baulch B. 2002. The spatial distribution of poverty in Vietnam and the potential for targeting. Discussion Paper 42. Markets and Structural Studies Division, IFPRI (International Food Policy Research Institute), Washington, DC, USA.
- Poverty Task Force. 1999. Vietnam: Attacking poverty. Joint report of the Government of Vietnam, Donors, NGO Poverty Working Group presented to the Consultative Group meeting for Vietnam, December 1999. The World Bank, Hanoi, Vietnam.
- Vu Trong Binh. 2002. Quality in the process of organization of farmer inserting in the market. The case of pig's commodity chain. PhD thesis. Institut National Agronomique Paris-Grignon, France. 300 pp. (In French).

- Vu Trong Binh and Casabianca F. 1996. La commercialisation de la viande porcine dans le district de Nam Thanh. Actes du séminaire: Agriculture familiale et gestion des ressources naturelles dans le bassin du Fleuve Rouge, Ha Nội, Vietnam, 9–12 avril 1996. pp. 81–91.
- Vu Trong Binh and Bui Thi Thai. 2001. Animal commodity chain and question of research. Annual Research Magazine of VASI. VASI (Vietnam Agricultural Science Institute), Hanoi, Vietnam. 7 pp. (In Vietnamese).
- Vu Trong Binh, Le Manh Dung, Pham Van Duy and Trinh Van Tuan. 1998. Diagnostic method of the eco-pathology of animal productions. 70 pp. (In Vietnamese and French, Unpublished report.)
- Vu Trong Binh, Bui Thi Thai and Casabianca F. 1999. Methodology of research intervention. The organizational process of group producers for inserting to the market. The case of animal commodity chain. Research Report. VASI (Vietnam Agricultural Science Institute), Hanoi, Vietnam. 35 pp. (In Vietnamese and French).
- Vu Trong Binh, Bui Thi Thai and Nguyen Van Thinh. 2000. Organization of farmers' groups to produce high quality pig. Paper presented at a seminar in Vietnam Minister of Agriculture and Rural Development and the French Embassy. 7 pp. (In Vietnamese and French).
- Vu Trong Binh, Bui Thi Thai and Dao The Anh. 2002. Questions of research about the organization of Chain's management of quality between actors and the development of agricultural commodity chain. The seminar of the French Embassy and the National Sciences, Sociology and Human Center, Ha Nội, Vietnam. 6 pp. (In Vietnamese and French).