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**AN ANALYSIS OF ACCESS TO CREDIT BY ANIMAL
PRODUCING HOUSEHOLDS IN HAI DUONG PROVINCE,
VIETNAM**

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présentée en vue de l'obtention du grade de
docteur en sciences agronomiques et ingénierie biologique**

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Summary

In a context of increasing demand for meat and fish, the animal production sector is seen as a driver of growth for agriculture in Hai Duong Province, Vietnam. However, the growth prospects of this sector seem undermined by a limited credit supply. This study aims to explore access to credit by animal producing households, factors affecting their credit accessibility and the influence of credit and non-credit factors on animal production. The study results show that all households surveyed, both the animal-based group and the non animal-based group, need credit for both production activities and consumption. The formal sector, which for the most part provides credit for production activities, did not meet the credit needs of the animal producers. Thus, only 52% of surveyed households applied to commercial banks for credit, the remaining households felt that they had no chance of receiving loans. Looking at the household characteristics as the center for analysis, it was found that physical collateral, the area of the fish pond and social relationships positively affected the probability of credit access by animal producing households. In addition, the area of the fish pond, number of laborers, share of income from animal production and social relationships positively affected the borrowing amount that was approved by commercial banks. Among animal producing households, the poor households likely had a lower probability of credit access and lower borrowing amounts than the non-poor households. The credit needs of farmers were often more rationed by commercial banks. Furthermore, some weaknesses of the rural lending apparatus in Hai Duong Province impeded access to credit by households. The credit constrained households accounted overall for 71% of the households surveyed. On the other hand, both the animal-based group and the animal-based group also suffered from some non-credit constraints relating to production and marketing. Within each group, the non-credit constraints caused a similar negative influence on animal production income, relatively speaking. Credit accessibility was different among households. As a result, for a given production unit, credit constrained households generated less income than non-credit constrained households. Improving the credit supply and some non-credit factors is expected to increase income from animal production. The study mainly suggests that the local authorities should support small-scale animal producers to establish animal producer groups to overcome constraints to credit access, production and marketing. Besides strengthening the credit supply to individual borrowers, the formal sector should grant feed purchase credit vouchers to animal producing groups.

Keywords: access to credit; credit accessibility

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Résumé

Face à une forte évolution de la demande en viande et en poisson, le secteur des productions animales est perçu comme un moteur de croissance pour l'agriculture de la province de Hai Duong, au Vietnam. Cependant, les perspectives d'expansion de ce secteur semblent hypothéquées par une offre de financement limitée. Cette étude a pour objectif d'analyser l'accès au crédit des exploitations orientées vers les productions animales ainsi que l'influence du financement, entre autres facteurs, sur les performances économiques de ces activités. Les résultats de l'étude montrent que tous les ménages interrogés ont des besoins de financement tant pour les activités de production que pour leur consommation. Le secteur formel, qui assure majoritairement le crédit destiné aux activités de production, ne rencontre toutefois pas les besoins exprimés par les producteurs. Parmi les ménages sondés, 52 % d'entre eux seulement s'adressent au secteur formel, les autres estimant n'avoir aucune chance d'être financés. Les analyses montrent que certaines caractéristiques des ménages telles que la possession de garanties physiques, la taille des mares piscicoles et l'insertion sociale influencent positivement l'accès au crédit. Les deux derniers facteurs de même que le niveau de revenu dégagé par les productions animales et le nombre d'actifs sur l'exploitation semblent être déterminants dans l'importance des montants alloués par les banques. Il arrive en effet fréquemment que les demandes de crédit soient rationnées par les bailleurs du secteur formel. Globalement, l'étude démontre que 71 % des ménages interrogés se trouvent dans une situation contraignante vis-à-vis de l'accès au crédit. L'analyse se base ensuite sur des échantillons d'exploitations qui se distinguent par la présence ou l'absence de contrainte de financement pour comparer la rentabilité des productions animales. Les résultats montrent que les ménages en situation contraignante vis-à-vis de l'accès au crédit génèrent un revenu unitaire moindre que ceux qui bénéficient d'un meilleur accès au crédit. D'autres contraintes relatives à la production et à la commercialisation sont également mises en évidence ainsi que leur effet négatif sur les performances économiques des éleveurs. En conclusion, l'amélioration conjuguée de l'offre de crédit et la levée de certains autres facteurs limitants devraient procurer une augmentation significative des revenus générés par les productions animales. L'étude suggère notamment que les autorités locales soutiennent les initiatives de groupements d'éleveurs susceptibles de surmonter ces contraintes. Ainsi, outre le renforcement de l'offre de crédit à un emprunteur individuel, le secteur formel devrait pouvoir octroyer des bons d'achat à crédit pour des groupes d'éleveurs.

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Le Thi Minh Chau
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ABBREVIATIONS

ADB	Asian Development Bank
BWTP	Bank with the Poor Network
CGAP	Consultative Group to Assist the Poorest
DARDH	Department of Agricultural and Rural Development of Hai Duong
FAPRI	Food and Agricultural Policy Research Institute
Fre.	Frequency
GDP	Gross Domestic Product
GO	Gross Output
GSO	General Statistics Office
HDSO	Hai Duong Statistics Office
IC	Intermediate Cost
IFAD	International Fund for Agricultural Development
ILRI	International Livestock Research Institute
MFI	Microfinance Institutions
Num.	Number
PCFs	People's Credit Funds
Per.	Percentage
Sao	Sao = 360 m ²
S.D.	Standard Deviation
VA	Value Added
VACI	Vietnam Agrifood Consulting International
VBP	Vietnam Bank for the Poor
VBSP	Vietnam Bank for Social Policies
VBARD	Vietnam Bank for Agriculture and Rural Development
VND	Vietnamese dong
mil.VND	Million Vietnamese dong
bil.VND	Billion (one thousand million) Vietnamese dong
1 USD = 19,100 VND	
1 EURO = 26,000VND	

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INTRODUCTION

Agriculture has played a crucial role in Vietnam because of its contribution to the economy and rural development. Although its share in the gross domestic product (GDP) has declined as industrialization has progressed, agriculture still remains a very important sector of Vietnam's economy. Presently, agriculture contributes 20% of the total GDP and 23% of total export value. Furthermore, agriculture has been very significant in terms of employment generation, as about 71% of the population lives in rural areas and about 60% of the total work force is engaged in agriculture (GSO 2011).

In the past, most of the growth of agriculture in Vietnam has been due to crop cultivation, especially rice. This is not going to be the case in the future, as the demand for rice growing will drop considerably, and a similar outcome is expected even for high-value commodities such as coffee. Given limited prospects for expanding crop production and changing patterns of demand both in Vietnam and in world markets, development of the animal production sector appears to be an important pillar of any development strategy for agriculture in Vietnam. Such a strategy aims at achieving higher and more stable rural incomes, reducing the incentives for people to migrate from rural to urban areas, making the farming system more sustainable in the long run and alleviating rural poverty (ACI 2001).

Of the total gross agriculture output, the proportion from animal production accounted for 19% in 2000 and reached 25% in 2010 (GSO 2011). However, animal husbandry in Vietnam is predominantly confined to small-scale household production units. Presently, small producers supply the majority of the meat in the markets, with most households operating individually in the production and marketing of livestock. For most of those households, livestock husbandry is an important source of cash income, providing at least 50% of cash income in smallholder production (Lapar et al. 2003). The Red River Delta region in northern Vietnam is one of the regions in which animal ownership is particularly high (VACI 2001).

Credit is an important policy instrument that can facilitate the uploading and use of modern technologies to increase production, especially in developing countries (Mittendorf 1986). Credit is also important for the modernization of small-scale agriculture, as well as marketing development being introduced into rural economics (Hosseini et al. 2012). The rural credit market in developing countries is often described as repressed, imperfect and fragmented. Segments of borrowers commonly have different levels of access to certain types of loans and certain types of credit institutions (Hoff and Stiglitz 1993).

In Vietnam, the Vietnam Bank for Agriculture and Rural Development (VBARD), the Vietnam Bank for Social Policies (VBSP) and People's Credit Funds (PCFs) belong to the formal financial sector. They are the main source of credit in rural areas. In 2001–2010, the annual growth rate of the credit supply from VBARD, VBSP and PCFs were 21%, 34.5% and 22.6%, respectively (VBARD 2005; VBARD 2010; Mix Market 2012). These growth figures resulted from the implementation of credit policies to promote agriculture and rural development in Vietnam. Besides, from 2003–2007, the government of Vietnam invested 113 bil.VND in the agricultural sector, roughly estimated to meet only 17% of the actual capital needed by this sector (Phong 2010). Many Vietnamese experts stated that the government's investment in rural areas and the credit provision for agriculture are mismatched. There is a relatively large gap between the economic contribution of agriculture to Vietnam's GDP and the credit provision for agriculture (Anh 2010; Ha 2010).

Unlike commercial livestock producers, the smallholder producer is seen as having less access to financial capital (Nin et al. 2003). Given the limited financial capital of the poor and small producers, they cannot adopt new production technologies that demand higher investment and higher production costs (Lapar et al. 2006). Access to credit could reduce the constrained financial capital of farmer households and provide working capital for farmers to purchase production inputs and apply modern technologies as well. In Vietnam, credit is generally shown to have a significant impact on agricultural production (Duong and Izumida 2002). This suggests that improved access to credit by livestock producers will promote animal production.

Hai Duong Province is located on the Red River Delta of Vietnam. It has a high density population. In Hai Duong, agricultural land has been significantly reduced due to industrialization, 8% in the 2006–2010 period. Currently, 80% of the population lives in rural areas. Agriculture occupies 60% of the total work force (HDSO 2011). The high population and the large proportion of the labor force working in agriculture are putting heavy pressure on rural land. The poverty rate of Hai Duong Province (11%) is higher than that of other provinces in the Red River Delta region (GSO, 2011). Therefore, poverty reduction, improvement in agricultural production and creation of stable incomes for farmers are main concerns of the local authorities. The increasing demand for meat and fish from the 3.8 million persons in Hanoi, near Hai Duong Province, represents a potential market for farmers in the province. Given limited agricultural land, the expansion and improvement of livestock production not only would generate income but also create jobs for farmers, especially unskilled laborers and the poor.

On the other hand, in recent years, animal production in Hai Duong Province was adversely affected by disease outbreaks, causing losses for many animal producers. Therefore, farmers had a high demand for credit to deal with their capital constraints.

With regard to the credit supply, the formal sector has achieved success in expansion of the credit supply. The supply in the formal sector grew at a rate of 28% from 2005 to 2010 (VBARD in Hai Duong 2011; VBSP in Hai Duong 2011). It is, however, necessary to investigate access to credit at the farm level, especially by animal producing households.

Research questions and objectives of the study

The overall purpose of this study is to create an understanding of access to credit by animal producing households and the influence of credit and non-credit factors on animal production, which calls for a policy to increase the income of animal producers. Some questions related to the study purpose are as follows:

- ✓ What is the current status of access to credit by animal producing households? What factors affect access to credit?
- ✓ Besides access to credit, are there other non-credit factors leading to constraints in animal production? How do credit and non-credit factors influence animal production?
- ✓ How can access to credit by animal producing households be improved, thus promoting animal production and increasing farmer income?

Pursuing its major purpose, the study was conducted to demonstrate how facilitating credit access for animal producing households would improve their financial status. The rural credit market in Vietnam and in Hai Duong Province reflects overall the picture of rural credit at the national and provincial levels. At the household level, with the core analysis of access to credit, non-credit factors must also be explored for a better understanding of the more specific overall situation of animal production on the study sites.

This study has the following main objectives:

1. Review the performance of the rural credit market and provide an overview of animal production in Vietnam
2. Analyze access to credit by animal producing households from various credit sources and identify factors affecting credit accessibility from the formal sector in Hai Duong Province.
3. Analyze the influence of credit and non-credit factors on animal production in Hai Duong Province.
4. Point out the policy implications of better access to credit from the formal sector and increasing income of animal producing households.

Hypotheses of the study

Based on the context of the country as well as the actual situation of rural credit and animal production on the study sites, the following hypothesis were applied in this study, including:

- ✓ In Vietnam, farmers face constraints of access to credit, leading to varying degrees of credit accessibility among farmers. The credit accessibility of farmers is partly influenced by the human, physical and social capital of farm households.
- ✓ Animal production is not only influenced by the credit accessibility of farmers but is also affected by non-credit factors (i.e. production techniques, inputs and outputs markets, bargaining power of farmers). Although credit is one of the important factors to promote animal production, it is very necessary to enhance the credit supply and to improve non-credit factors in order to generate a stable income from animal production. This, in turn, will enable farmers to have a better access to credit.

Structure of the thesis

In order to achieve the study objectives, the thesis is structured with an introduction, six chapters, a conclusion and a synthesis of implications. The introductory part gives some information on Vietnam and Hai Duong Province, regarding agriculture, the rural labor force, animal production and credit supply as a basis for the statement of problems. It also includes the research questions, objectives of the study and hypotheses. Chapter 1 aims to provide some concepts and findings from previous studies that are very important for designing the study methodology. Chapter 2 provides an overview of rural credit and animal production in Vietnam, which enhances the reader's understanding of the country context, highlighting some characteristics of rural credit and animal production. Chapter 3 of the thesis explains the methods used for this study in order to reach the study's objectives. Chapter 4 contains general information on Hai Duong Province and the performance of the formal credit sector on the study sites. Chapter 5 analyses in depth access to credit by the surveyed households, including investigation of the lending procedures of formal credit sources, participation of farmers in the credit market, credit use, problems of getting access to credit at commercial banks, factors affecting credit accessibility, social networks and their relation to credit access, discussion of the requirement for physical collateral (for secured loans), identification of the strengths and weaknesses of rural credit available from the formal sector. Chapter 6 explores the influence of credit and non-credit factors on animal production. This chapter includes an investigation of the involvement of households in animal production, constraints to animal production and marketing, income from all activities, cost and return analysis and the influence of credit constraints and non-credit factors on reduction of income from animal production. Finally, the conclusion and implications sections give some findings relating to the research questions and some policy implications for better credit access and increase of farm household incomes.

CHAPTER I : LITERATURE REVIEW

A good understanding of the theoretical concepts and previous empirical studies is very useful as part of the methodology of any research study. With this in mind, Chapter 1 aims to provide a general understanding of rural finance, including basic concepts and approaches. Then, some terms, including access to credit, participation in credit programs, credit rationing and credit constrained households, are explained. A summary of findings from some previous studies on credit access and the impact of credit on production and other aspects is provided. Finally, the agricultural value chain, currently applied as an essential approach for agricultural finance in developing countries, is developed to create a better knowledge of agricultural finance and contributes to the policy implications formulated in this study.

1.1. Understanding rural finance

1.1.1. Fundamental of rural finance

There are overlaps in the financial sectors that deal with rural, micro and agricultural finance. It is important to understand the difference between three terms. *Rural finance* refers to financial services (credit, savings, payment transfers and rural insurance) offered and used in rural areas by people of all income levels. *Agricultural finance* is a subset of rural finance dedicated to financing agriculture-related activities, such as inputs supply, production, distribution and wholesaling, and marketing. *Microfinance* provides financial services for poor and low-income people by offering small loans and flexible savings services where permitted, while accepting a wider variety of assets as collateral (CGAP 2003).

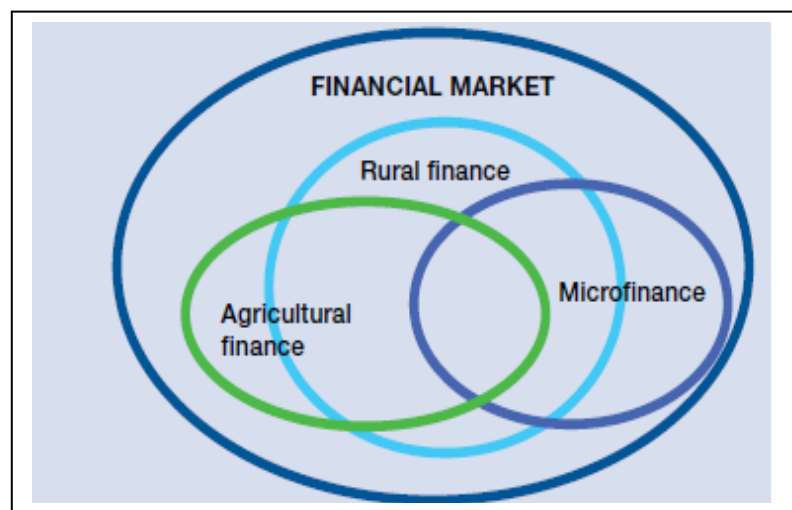


Figure 1.1. The boundaries of the financial market: rural finance, microfinance and agricultural finance

Source: CGAP (2003)

The rural population is generally poorer than their urban counterparts. They generally work in agriculture or agriculture-related activities, and they live in areas in which the overall population density is low. These factors, combined with poor infrastructure and lack of integration with urban markets, cause rural inhabitants in many countries to live in relative isolation. These characteristics are related to the following problems in rural financial intermediation and are considered as systemic weaknesses of the rural financial market. As examples:

- Low population density, small average loans, and low household savings increase transaction costs.
- Rural clientele often lack the traditional forms of collateral required by commercial banks.
- Poor communication and lack of integration with other markets result in highly fragmented markets, which create information barriers and limit risk diversification.
- Seasonality of the rural agricultural business cycle and the high probability of covariant production price and income shocks add to the risk of rural financial intermediation.

Due to high risk and low profitability often caused by those problems, commercial banks have largely avoided serving rural areas. As a result, specific financial institutions were created to help individual farmers adjust to the market economy (Yaron et al. 1997; Takashi 2009).

1.1.2. Traditional approach of rural finance (poverty reduction approach)

Rural finance in developing countries has been characterized by two approaches, including the traditional approach (poverty reduction) and the new approach (financial systems) (Yaron et al. 1997; Robinson 2001).

As a result of the systemic weakness of rural financial market, governments of developing countries responded to the perceived shortage of financial services in rural areas by creating a range of different institutions such as special agricultural credit institutions, intended to channel government and donor funds to rural clients, especially farmers. Governments have recognized that rural areas need modern technology and access to credit. Because they considered rural inhabitants too poor to save money, governments intervened to make cheap credit available to farmers, drive usurious moneylenders out of business, and “compensate” for the low prices of agricultural goods and other distortions through subsidies. The *traditional approach* of rural finance was to set up state-owned, specialized institutions that received concessional loans to be made at below-market interest rates to targeted agricultural producers for specific types of inputs or investments. Performance was assessed by the volume of loans disbursed and the impact of the loans on production. These interventions did boost agricultural production. Though well intended, some of these initiatives were misdirected and did not address the real problems. Indeed, some even exacerbated the problems. A few examples:

- Subsidized interest rates often led to the crowding out of poor farmers because the subsidies were captured by wealthier, better-connected farmers, increasing the income disparity between rich commercial farmers and poor subsistence farmers and reducing

access to credit by the poor. In many instances, subsidized credit also became highly politicized, and it was consequently difficult to eliminate.

- Inefficient business practices often resulted in substantial losses and further reduction of access to financial services by the poor. Rural financial institutions were often treated as disbursement windows rather than as financial institutions, and recipients sometimes viewed “soft” loans as grants that did not have to be repaid.
- The focus on lending exclusively for agriculture increased the risk carried by rural financial institutions and reinforced the perception that lending to farmers in rural areas is a special activity, not to be integrated with the broader financial market.
- There was a strong emphasis on loan disbursements, while matters such as portfolio quality, non-farm rural development, savings mobilization and the efficiency of financial markets were neglected.
- The availability of cheap loans and debt forgiveness weakened the repayment culture and made lending unprofitable. Subsidized interest rates had costly macroeconomic implications. Targeting ignored the fungibility of money and the fact that the existence of distortions such as low food prices made agricultural investments less attractive than they would otherwise have been.

1.1.3. The new approach (financial systems approach)

According to Yaron et al. (1997), the new approach to rural financial intermediation that emerged in the 1980s favors a more indirect role for governments, emphasizes savings over credit and avoids subsidized interest rates. More broadly, it calls for governments to identify the causes of market failures and correct them through reforms rather than through direct financial intermediation interventions. The new approach referred to creation of a favorable policy environment for rural financial intermediation, which required macroeconomic stability, elimination of urban-biased policies, and promotion of integrated and resilient financial markets. Steps to reform the legal and regulatory frameworks can be taken even before the appropriate policies are put in place. In addition, good governance may well be the most important factor in the success of rural financial intermediates. All decision-makers must have clearly defined, consistently enforced powers and responsibilities. Management must be autonomous, as well as accountable for operational decisions, and clients’ interests must be fully represented. The appropriate form of supervision and prudential regulation depends on rural financial intermediate’s size, type and ownership structure. External supervision is particularly important for institutions that mobilize voluntary deposits from the general public. Other key requirements include:

- Clearly defined corporate strategies and objectives;
- Motivated and skilled staff;
- Innovative, low-cost ways of providing financial services;
- Positive real interest rates on both loans and deposits;
- Careful monitoring of portfolio quality, incentives for timely and full loan repayment, and active pursuit of delinquencies;

- Risk reduction through diversification and integration into the broader financial system; and
- Advanced management information systems that permit performance to be continually monitored.

1.1.4. Comparison between the traditional approach and the new approach

Table 1.1. Main features of the traditional approach and the new approach

Features	Traditional approach	New approach
Problem of definition	Boost agricultural production Reduce poverty	Reduce market imperfections and transaction costs for income expansion and poverty reduction
Role of financial markets	Stimulate production Help the poor	Intermediate efficiently
View of users	Beneficiaries: Borrowers	Clients: Borrowers and depositors
Subsidies	Heavily subsidy dependent	Increasingly independent of subsidies
Sources of funds	Vertical: Governments and donors	Horizontal: Primarily voluntary deposits
Associated information systems	Dense, fragmented and vertical assessing whether targets were met	Less dense and mainly horizontal management information system
Sustainability	Largely ignored	A major concern
Outreach	Short-time focus	Long-term concern
Evaluations	Credit impact on beneficiaries- mainly primary data	Performance of financial institutions- mostly secondary information

Source: Adams (1998)

A summary of the main features of the two approaches is presented in Table 1.1. The main differences result from the different goals that each approach follows. The first difference is that the traditional approach considers financial services for the poor as a policy tool while the new approach considers them as intermediate inputs to the process of production and consumption at the household level (Gonzalez Vega 2003).

The differences in perception then lead to differences in the ways of providing services and the target market. The traditional approach focuses on providing credit to the poor at a subsidized level and to poor households, while the financial market approach commits to providing a broader range of services at market level and to economically active low-income households. The traditional approach is concerned with how to control or redirect the supply of financial services, in order to pursue specific non-financial objectives, while the new approach is concerned with how to promote an outward shift to the supply, in order to improve the delivery of financial services as intermediate inputs (Gonzalez Vega 2003).

The second difference between the two approaches is the target clients. The traditional approach aims at providing financial services to poor households, especially the poorest of the poor, in order to help them get out of poverty, while the new approach aims at the economically active households or better-off poor households. The traditional approach argues that the poorest of the poor are those who need help because they are normally unemployed, have a low education, etc., and are unable to get access to financial services. However, the new approach argues that providing financial services to the poorest of the poor could harm both the poorest and the lenders because the poorest need basic needs rather than debts, and thus it affects their ability to repay the loans.

Nevertheless, it is recognized that these two approaches have a similar goal of expanding their activities, i.e. attain a broader scale of outreach. The traditional approach sees outreach as an immediate means to achieve poverty reduction and thus outreach is always considered as a goal of poverty reduction. On the other hand, the new approach, considers outreach as a result of the business.

An emerging issue is how to further expand financial services. The new approach proposes an application of market principles to microfinance, in which charging full costs of financial services provided is essential (Christen and Drake 2001; Charitonenko and Rahman 2002). However, it is possible that the commercial costs are much higher than the maximum cost that the households can afford. It is also possible that the extremely poor are excluded. It is implied that there should be a balance between the social and financial goals in developing a microfinance sector (Christen and Drake 2001).

Duong (2002) indicates that the new approach to rural finance requires many conditions, such as institutional capability, a certain level of human capital and potential for agricultural growth. These conditions are not easily fulfilled in low-income countries in general. Taking an example from the development of rural finance in Vietnam, according to Duong (2002) and Hao (2005), the combination of both the traditional approach and the new approach is likely applicable in Vietnam.

1.2. Concepts of access to credit and credit constrained household

The concept of access to credit has been mentioned by some researchers. Zeller et al. (1996) stated that “*access to credit is the ability of the household or its members to enter into contractual arrangements for credit service.*” Another explanation of access to credit is that “*A household has access to a particular source of credit if it is able to borrow from that source, although for various reasons it may choose not to borrow. The extent of access to credit is measured by the maximum amount a household can borrow. If this amount is positive, the household is said to have access.*” (Diagne and Zeller 2001).

Access to credit is often confused with *participation in credit programs*. Indeed, the two concepts are often used interchangeably in many credit studies. The crucial difference between the two concepts lies in the fact that *participation in a credit program* is something that households choose to do, while *access to a credit program* is a limiting constraint put upon them (e.g. availability and eligibility criteria of credit programs) (Diagne et al. 2000). Participation is observed when a household applies for and successfully enters in to contractual arrangement for a loan. Thus, the participation is dependent on access to and on

the demand for credit. In other words, participation is more of a demand-side issue related to the potential borrower's choice of the optimal loan size, while access is more of a supply-side issue related to the potential lender's choice of the credit limit (Diagne et al. 2000).

Access to credit is not only measured by the proportion of households having an outstanding debt, as some rural households apply for credit and are refused, whereas others are self-excluding themselves from the credit market because they fear being turned down, while their application for credit is not zero. Thus, demand for credit can be a latent demand (Duflo et al. 2008).

In other words, *access to credit* does not imply that the demand for credit will be satisfied. Lenders determine how much credit is allocated based on the probability of loan default, often resulting in *credit rationing*. The probability of default may be influenced by a number of factors that include the expected returns of the project, the terms of the loan, market imperfections and the characteristics of the borrower. In practice, households apply for credit, but lenders determine how much credit is allocated to them, based on their perception of the household's creditworthiness. This often results in *credit rationing* that reflects the lender's perception of the household risk profile. Understanding the factors that influence *credit rationing* highlights specific interventions that may raise the creditworthiness of households and create advantages for both lenders and households. From the lender's perspective, the improved creditworthiness of borrowers will reduce the risk of default and improve profitability and financial sustainability. From the household side, increased creditworthiness means increased access to credit, which may provide a possible escape route from poverty (Diagne et al. 2000).

Different farming households will have different needs for credit but a good sign of some levels of credit constraint is the gap between the demand and supply of credit. *Credit constraint* can be defined as a gap between demand for credit and the supply of credit (Omonona et al. 2010). According to Jappelli (1990) and Feder et al. (1990) credit constraint of household is not directly observable, but from the survey response, it is determined whether a given household was constrained or unconstrained. Example, Zeller et al. (1996) employed the direct information from household surveys to decide whether a household is constrained in credit market. Three questions were constructed in questionnaire. These were: (1) "Have you applied for a loan from banks, or government or semi-government institutions over the recall period?" followed by, (2) "If you applied for a loan, did you get it?" and (3) "If you got the loan: a) was it on time? b) was the amount sufficient for your requirements?" The process is shown diagrammatically in Figure 1.2 below.

The identification of discouraged borrowers begins with those who replied no to the first question. Although respondents usually gave several reasons for not applying, these had to be ranked in order of importance. Those who gave at least one of the following reasons (in any order of importance): (i) "Could not offer the required collateral," or (ii) "Felt the procedure was complicated and expensive," were classified as discouraged, provided they did not simultaneously rank as most important one of the following, "no need for credit" or "dislike for credit on religious grounds." Anyone else who answered no to this question was classified as unconstrained. Rejected borrowers were defined as those who answered no to the second question, and rationed borrowers as those who answered no to any of the sub-questions to the third question. *Credit constrained households* were then defined as those that fell into any one of these three categories (i.e. discouraged, rejected, or rationed). The category of discouraged borrowers, however, may include non-applicants who could have obtained a loan but did not

both applying for it because of the expected costs of the application (i.e. complicated and/or expensive procedure) and other loan costs (i.e. interest) were beyond the expected benefits of the loan. These households are therefore categorized as unconstrained.

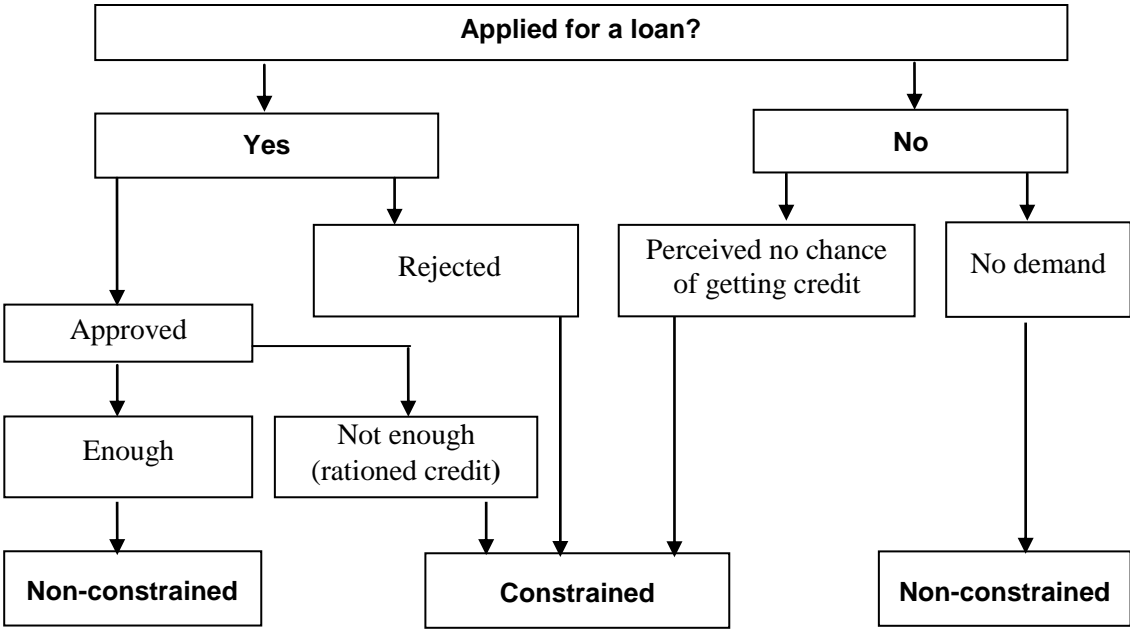


Figure 1.2. Concept of non-credit constrained households and credit constrained households

Source: Zeller et al. (1996)

1.3. Access to credit—Findings from previous studies

It is realized that studies on access to credit and credit rationing have been conducted by many researchers. Zeller (1994) employed two-stage probit models to estimate determinants of credit rationing by informal lenders and by members of community-based groups in Madagascar. At the first stage, it aimed to identify factors that determined why the household or a member of it decides to apply for credit. At the second stage, it was a screening process to find if the lender decides to give the applicant the amount applied for in full, or to partially reduce the credit amount, or to fully reject his or her application. The results showed that formal groups and informal lenders obtained and used information on the creditworthiness of the credit applicant. Land considered as criteria for loan rationing did not play a role either for informal lenders or for members of the group. Informal lenders and group members could obtain information on the wealth, indebtedness and income potential of the credit applicant. Both lenders rationed loan demands in view of the household wealth and the ratio of outstanding debt over income (defined as the leverage ratio). Thus, the results confirmed the theoretical argument that community-based groups had an information advantage over distant formal bank agents. Like informal lenders, the group members had access to information that was only available to insiders of the borrower’s community. The substitution of physical for

social collateral through group liability could therefore contribute to increasing participation of the poor in credit markets. However, the results also showed that formal group members and informal lenders similarly considered the wealth and leverage ratio as criteria for rationing. Thus, inequalities in frequency of loan rationing between the poorer and the richer households not only existed in the group-based credit schemes, but also in the informal credit market. The leverage ratio was seen as valid banking criteria for loan rationing. To the extent that poorer households might tend to have higher leverage ratios, it had to be concluded that credit for the poor also has its limits.

Cuong (2007) empirically analyzed the rural credit market in Vietnam in the period 1993–1998. The study distinguished between the formal and informal sectors of the credit market and their interaction with each other. It also highlighted the characteristics of borrowers and their impacts on credit participation and the amount of credit obtained. Heckman two-stage econometric models were used to identify the probability of participation in the credit market and amount of credit received as a joint determination of the function of the household's application for credit and the function of lender's decision on supply. The result of the study showed that the education level, condition of health, fixed assets held and distance from the household to a formal bank branch were the most important factors affecting the household's access to credit. The demand and supply in the formal credit market showed a low participation probability. The high demand for formal credit in 1993 turned out as high level of credit rationing due to limitation of formal credit access. The role of formal credit in supporting rural development may be limited.

The determinants influencing commercial banks to ration agricultural credit in Southwestern Nigeria was identified by Rahji and Adeoti (2010). Evidence, from the estimated logit model indicated that the farm size of the farm household, its previous year's income, enterprise type, and level of household agricultural commercialization were significant but negative factors influencing the bank's decision to ration credit. Higher values of these factors decreased the probability of being credit constrained. The number of dependents in the household had a positive significant impact on the probability of being credit constrained by the banks. Hence, higher values of this variable increased the likelihood of being credit rationed. The gender variable was positive, which showed that the possibility of being credit constrained was higher for a female than for a male. The policy of farm size expansion in terms of land redistribution to the farmers, who are small-scale producers, will improve their chances of obtaining credit. The farm income policy in terms of adequate remuneration for farmer price support and provision of storage facilities that will help them speculate on the market and not sell at low prices at harvest will improve their probability of not being credit constrained or rationed.

Access to credit is affected not only by household characteristics but also by social capital and the social network. Social capital has been defined by some researchers. According to Putnam (1993) "social capital is as a set of horizontal associations between people. Social capital consists of social networks and associated norms that have an effect on the productivity of the commune." Knoke (1999) also put greater emphasis on the formation of social capital, stating that "social capital is the process by which social actors create and mobilize their network connections within and between organizations to gain access to other social actors' resources." In general, social capital often concerns three elements: the social network, the relationships among actors in the social network and the benefit or, sometimes, loss created through relationship interaction in the social network. The role of social capital in access to credit has been investigated by numerous studies. Ajani and Tijiani (2009) used data from household

surveys and the probit regression model to examine the role of social capital in accessing microcredit in Ekiti State, Nigeria. The results revealed that the aggregate social capital index positively affected the probability of members of networks obtaining microcredit. The marginal effect showed that increasing social capital by a unit will lead to 0.22% in probability of members of associations obtaining credit. Disaggregating the social capital index, memberships in associations, cash and labor contribution of members to various associations significantly influenced the probability of obtaining microcredit. It also found that the loans received by households from networks and associations were untimely and this may lead to diversion of loans for non-economic purposes, which will affect repayment schedules. Investments in social capital deserve to be part of poverty alleviation programs since the return on investments in the social capital was larger for the poor than for others.

Exploring the relationship between the social network and credit access, Okten and Osili (2004) investigated how family and community networks affect an individual's access to credit in Indonesia. The results showed that social networks had an important role in the credit application process. Attendance at the community meeting and the number of economically active siblings positively affected the decision on the credit application. In particular, attendance at community meetings increased the probability of applying for credit by 8%. Individual and household characteristics also influenced the credit application decision. In addition, age, household headship, marital status and educational attainment positively affected the decision on the application for credit. An improvement in an individual's participation status increased the probability of being granted credit by 6%. The study concluded that community participation and, to a lesser extent, family networks had an important impact on an individual's ability to access credit. Community networks appear particularly important in gaining awareness of new credit sources.

Also discussing the information dissemination role of social networks, Dufhues et al. (2002) studied the information dissemination networks of VBSP in northern Vietnam. They concluded that since there are many actors in the networks, information did not reach its intended objectives in original forms and in a timely manner. This "fuzzy" information dissemination, caused both objectively and subjectively by actors in the networks, reduced the credit access capacity of poor households and the efficiency of microcredit programs.

Recently, Anggraeni (2009) indicated that trust is an important factor in the relationships between social networks and credit access. In the research, the "vertical network" between Chinese coconut traders and local farmers created trust among themselves, which results in benefits to both sides. The farmers could get in-kind credit in the form of consumer goods from the traders during lean times. In return, the traders have a secure supply of copra (dried coconut) from the farmers.

In conclusion, many previous empirical studies indicated that rural households in developing countries are still confronted with credit access constraints or credit rationing by lenders. The human capital, social capital and the wealth of households commonly related to access to credit by rural household. Therefore, it can be expected that improvement of the rural credit market would make a better credit supply available to rural households.

1.4. Credit constraints and their impact on household production and welfare

Agricultural financing is an important factor in rural development in developing countries. Credit has a crucial role in production investment, increasing productivity and improving technologies. Generally, credit accessibility is important for improvement of the quality and quantity of farm products, which commonly increase farmer income. Therefore, with limited access to credit, the budget balance becomes a constraint, where expenditures have to remain less or equal to the sum of receipts during the period, along with accumulated savings and credit availability. Hence, credit constraint limits the optimum production or consumption choices.

The adverse outcome of credit constraint in developing countries has been amply documented in the empirical literature due to its impacts on agricultural productivity and the value of agricultural outputs (Feder et al. 1990; Freeman et al. 1998; Olagunju 2007); production efficiency (Udayanganie et al. 2006; Ayaz et al. 2010; Islam et al. 2011); farm profits (Foltz 2004); farm investments (Petrick 2004; Kohansal et al. 2008); income, food consumption and household expenditure (Diagne and Zeller 2001; Cuong 2008); employment and rural wages (Binswanger and Khandker 1993); weight of children (Foster 1995) and child schooling (Doan et al. 2011).

Feder et al. (1990) used a household sample from rural China and developed switching regression models to identify the influence of credit constraint on production output. They hypothesized that the production function of constrained households should differ from that of unconstrained households. Since production and consumption decisions were inseparable for households that were constrained, they made the following assumptions: (i) all farm households were unconstrained in all markets, except the credit market; (ii) some households were also constrained in the credit market. For these households, production decisions were influenced by household characteristics; (iii) therefore, in estimating production functions, household characteristics should be included for constrained households and should be left out for unconstrained households. The first step in the switching regression model was to estimate a variable that determines whether or not a household was credit constrained. In the second step, the production equation included total liquidity, land, education and farming experience. The authors found that one additional *yuan* of credit in credit constrained households can generate an additional output in the value of 0.235 *yuan*.

Similarly, Foltz (2004) conducted a study in Tunisia to investigate whether Tunisian farmers were rationed in credit markets and whether that rationing affected production and investment. The probit model was employed to estimate the profitability of credit rationing. In addition, the author also used an exogenous switching model to test the relationship between credit access and farm profits. The study indicated that farmers who had more titled hectares of land, better credit backgrounds, larger farms, higher expenditure levels, less agricultural equipment, lower debt levels and lower overall profitability were not rationed in the credit market. Higher household income levels, as a proxy for expenditure, would seem to increase credit supply. In other words, a wealthier household would be more likely to receive credit. Farmers with more equipment were more likely to be credit rationed. It may be that more mechanized farmers have an ongoing need to purchase more equipment, leading to greater demand. As most agricultural equipment cannot be used as collateral, it did not increase credit supply. The value

of agricultural equipment increased farm profits in both the rationed and non-rationed farmers. The number of family members had a negative impact on the profit of both rationed and non-rationed farms. Household expenditure (as a proxy for overall household permanent income) and having title to land (as proxy for collateral) had a positive effect on profit. The liquidity effect of credit rationing on profits implies that better access to the credit market will improve the profitability of a higher number of farmers.

Regarding the relation between credit and livestock production, Freeman et al. (1998) examined the impact of credit on the milk productivity of smallholder dairy farms using cross-sectional survey data from Ethiopia and Kenya. The study showed that the marginal contribution of credit to milk productivity was different among non-credit constrained and credit constrained farmers. Using investment in crossbred dairy cows (as a proxy for the use of credit to improve milk productivity) was relatively high on the liquidity of unconstrained farmers compared to the liquidity of constrained farmers. Much of the variation in milk productivity was explained by the number of crossbred milking cows in the dairy herd. Total expenditure on variable inputs did not influence milk production on both non-credit constrained and credit constrained farmers, probably because a relatively small amount of supplementary feed purchased was used on these farms. As credit is likely to facilitate investment in crossbred dairy cows, it will have substantial impacts on smallholder dairy farms.

Olagunju (2007) also explored the impact of credit on the resource productivity of sweet potato growers in Nigeria. The objectives related to socioeconomic differences and resource use efficiency between farmers with credit and farmers without credit. The marginal value product for credit users was approximately uniform, which suggested that their resources were optimally used. On the other hand, the marginal productivity also was positive but less than uniform for the fertilizer, planting materials, labor and capital for non-credit users. It indicated that the underutilization of resources thereby resulted in lower output for non-credit users. It is therefore recommended that policies should be made to ensure the availability of credit for farmers.

The role of credit on production efficiency of the farming sector in Pakistan was investigated by (Ayaz et al. 2010). The study employed a two-stage estimation technique to examine the technical efficiency and its determinants of rural farmers in Faisalabad. The results showed a 0.78 average efficiency score with a minimum value of 0.42 for credit users and a minimum value of 0.23 for non-credit users. It also was found that farming experience, education, access to farming credit, herd size and number of cultivation practices had a positive and significant correlation with the farmer's efficiency. The coefficient value of the credit dummy indicated that a 1% increase in access to credit would increase by 0.039% the technical efficiency of farms. This confirmed the expectations that agricultural credit access increases farming efficiency, as it allows farmers timely use of farm inputs and application of new and modern technology. Similarly, Udayanganie et al. (2006) estimated the technical efficiency of paddy production in Sri Lanka, with special emphasis on the use of agrochemical inputs and determinants of technical efficiency. Average technical efficiency was estimated to be 0.37. Among the determinants of inefficiency, the importance of credit and extension services on improving farmer efficiency played a significant role in the technical efficiency of paddy production.

Credit constraint not only has an impact on agricultural productivity, technical efficiency and income of farm households but also on other aspects of rural households such as employment, rural wage, food consumption and child schooling. To investigate the effects of the supply-led

agricultural credit policy on agricultural output, non-farm growth, employment, and rural wages, Binswanger and Khandker (1993) used data from 85 districts in India in the period 1972–1981 for their study. Their analysis suggests that the impact on agricultural output has been modest, so that costs of the public credit system may outweigh the benefits in additional agricultural output. However, rural credit had significant positive effects on non-farm growth, employment, and rural wages.

Diagne et al. (1996) analyzed the impact of access to credit on technology adoption, incomes, household food security and household nutritional status in Malawi. It was found that the extent of the household's access to credit had positive multiplier effects on both seasonal non-farm (1.50 *kwacha* in additional income per capita for each additional *kwacha* of credit) and annual total incomes (a marginal increase in income of 4 *kwacha* per capita). In terms of household food security, the authors found an increase of 0.8 kcal in per capita daily intake for each additional *kwacha* credit made available to the household. The results of the study also showed a negative relationship between chronic malnutrition and a lack of access to credit.

Pursuing the objective of poverty reduction, the Vietnam Bank for Social Policies has designed a credit program aimed at poor households. Cuong (2008) conducted a study to investigate how well the credit program was reaching the poor, and to what extent the program was impacting on household welfare and poverty reduction. The data on Vietnamese household living standard surveys, collected in 2002 and 2004, was used for data analysis. It showed that the program was not well targeted on the poor. Poor households received smaller amounts of credit than the non-poor. In addition, empirical results from an impact evaluation showed that the program had a positive impact on consumption expenditures per capita and income per capita of the participating households. Consequently, the program helped reduce the poverty rate of the participants.

In conclusion, the findings of many previous studies indicate that credit plays an essential role in increasing input expenditure for agricultural production, improving productivity of crops and livestock husbandry and increasing agricultural profit or farm income. In addition, rural credit has a positive impact on the household expenditure for consumption as a welfare indicator. However, the impact of credit use is different among countries. Generally, the supply of credit makes an important contribution to rural development in developing countries.

1.5. Agricultural value chain financing—An essential approach for agricultural financing

1.5.1. An essential approach for agricultural financing

In 2008, a food crisis turned attention to the need for increased investment in agriculture. In addition, in 2009, the financial crisis lowered the availability of financing available to all sectors, due to the loss of financial assets of banks, an increase in required reserves and a reluctance to borrow or the requirement of additional collateral in order to qualify for credit. Hence, the use of value chain products and processes as collateral becomes more important than ever (Shwedel 2010).

Access to timely and reasonably priced financial resources also plays an important role in facilitating inclusion of smallholders into competitive markets. Without these timely resources, it is difficult to meet market demands. Typical loans from banks involve relatively high transaction costs on the part of both the lender and the borrower, and coupled with the climatic and market risks of the sector make such loans unattractive to the lenders and unavailable or unattractive to smallholders. Likewise, the typical short-term, relatively high-cost financing of most microfinance loan products is not well adapted. Value chain financing in agriculture offers a response to the above-mentioned dilemma in two dimensions. For bankers and financiers, value chain finance in agriculture is an approach to financing that uses an understanding of the production, value added and marketing processes to best determine financial needs and how best to provide financing to those involved. By understanding the agricultural chain, the lender can make more informed decisions on how to structure financing to reduce the costs and the short- and longer-term risks so that financing becomes attractive. Funding may be done at many levels in the chain or could enter the chain at one point and then flow up and/or down through the chain to others. For smallholders, value chain financing offers two added options to conventional financing. They can often receive financing from other stakeholders in the chain, such as from contract farming arrangements whereby the contracting buyer provides the funding in cash or kind. They can also use their relationships (formal contracts or established informal agreements) with strong partners in their chain or chains, in order to secure bank funding that may not otherwise have been available. Either way can increase their access to capital and thus to growth. In summary, the flows of funds and internal and external financial arrangements among the various links in the chain comprise what is known as value chain financing. Stated another way, it is any or all of the financial services, products and support services flowing to and/or through a value chain. This can be internal financing directly from one value chain participant to another or external from a financial institution or investor based upon the borrower's value chain relationship and activities (Miller and Jones 2010).

The value chains approach is crucial for rural development and financing is an essential tool to achieve it. The business environment is changing considerably. This means that stakeholders must find new forms of organization and those forms are the chains and the key within those chains is the concept of risk management. Finance models that strengthen the integrity of the chains by reducing risk and improving business activity, also encourage the financing of microenterprises. How do we make small farmers bankable? By incorporating them into a value chain, where they become creditworthy, bankable, a risk that is manageable, with marketing that is stable and, hopefully, a sector that is sustainable. The success of agribusiness lies in articulated and coordinated strategies, based on a perspective of chains. Therefore, the activities of banks must be geared to the chain. The banks are much more willing to get involved when an agent operates within a chain than when he operates as an individual (Shwedel 2010). Value chain financing is not a theoretical concept, not an academic concept, but the reality of the structure and strategy of business. The context of agribusiness is changing. It is reflected in the actions of economic agents or actors to find new forms of organization for structuring businesses and competing. Effective risk management requires a thorough knowledge of the chain. Finance business is the business of information and knowledge. Additionally, regarding the empirical experience Shwedel (2010) emphasizes that the concept of agricultural value finance is more relevant than ever in recent years. The concept of agricultural value chain finance is a model for business operations and a tool for promoting rural development. Furthermore, agricultural value chain finance adopts a systemic

approach, resulting from an overview of all the actors and activities involved. Above all, it is a concept of how we see the chain, or the set of activities associated with the chain, and implies looking for ways to structure the financing accordingly, in order to minimize costs, maximize efficiency and minimize or reduce risks, which is most important. In other words, it is a concept based on information and analysis of risks, costs and benefits.

Understanding the chain concept and structuring finance in a way that strengthens the chain and their stakeholders is crucial for risk management. It is a strategy for managing risk and costs. Finance directed at the chain is more developed at the level of agro-industry and of medium-sized businesses but can effectively reach small entrepreneurs as well as small-scale farmers.

1.5.2. Types of agricultural value chain financing

Financing based on agricultural value chains promotes increased integration and partnerships between chains, identifies the weak links in order to be able to articulate the credit and non-credit services required, serves to warn of market changes and helps to extend finance to the poor population. Practical experience in many countries shows that trade credit, contract farming, out-grower schemes and warehouse receipt financing are existing types of agricultural value chain financing.

- ***Trade credit***

Trade credit is very common in agriculture. Farmers receive credit from input suppliers, intermediary traders and shops, or agro-processors, pledging to repay from future harvest income. Typically, this does not directly involve a bank, and the agreement is usually informal and based on trust. Trade credit is often provided in-kind (seeds, fertilizers, consumer goods), and payment is made in kind as well (final produce). Such arrangements nearly always concern seasonal credit only. The cost of credit (interest) is embedded in the agreed prices for inputs and outputs, and may be quite high. Many examples of simple trade credit arrangements (e.g. the cereals chain in Tunisia, cashew farmers in Guinea Bissau, rice growers in Cambodia, Mali, Senegal and Thailand).

- ***Contract farming***

A trader, exporter or agro-processor establishes pre-harvest purchase contracts with selected farmers or their representatives (an association or cooperative). This involves forward contracting of the crop (the price or pricing formula is fixed). The main motivation is to secure a supply of produce of a certain quality and at a specified time. Technical support to ensure quality may be part of the contract. Product standards are agreed to beforehand. As part of the forward contract, farmers receive partial prepayment. A bank can also be involved through a triangular arrangement (the sales contract becomes the surety). This arrangement nearly always concerns seasonal credit only. A special case is pre-harvest credit provided to cooperatives, enabling them to buy goods from their members. Pre-finance usually has a maturity of only several weeks. Contract farming coupled with financing is also common in horticultural production in Burundi, Rwanda, Mali, Senegal and Tunisia (e.g. coffee, green beans for export, tomatoes for processing).

- ***Out-grower schemes***

Out-grower schemes are a specific type of contract farming, often long-term. An out-grower scheme is an elaborate contract-farming arrangement emanating from a nucleus, a lead farm or processor (also called a “technical operator”), which gives out-growers access to its marketing, operational and logistical capabilities. Technical support may be provided to the out-growers. Loans may include investment financing (e.g. in trees and equipment). Out-grower schemes are most common in high-value, specialty crops with niche markets (e.g. tobacco in Malawi, pineapples in Ghana). Out-grower schemes also exist in animal production (e.g. chicken breeding).

- ***Warehouse receipt finance***

Warehouse receipt finance has long existed in grain-producing countries in Northern America and the former Soviet Union. Warehouse receipt finance was rediscovered some 15 years ago in Eastern Europe (Kazakhstan, Poland, Russia, Ukraine), but is now being introduced in Africa as well. It is applicable to agricultural commodities that can be stored, such as grain, coffee, cotton, wool or potatoes. The farmer delivers the grain to the (certified and secured) elevator for storage. The farmer subsequently hands the warehouse receipt to the bank as collateral for credit, often 70%-80% of the value in storage.

CHAPTER II : RURAL CREDIT AND ANIMAL PRODUCTION IN VIETNAM

This chapter provides an overview of rural credit performance and background information on animal production in Vietnam for a better understanding of the country context related to the study objectives. Five sections are structured in this chapter. The first part describes and analyses the rural credit market from 2000 to 2010. In the second part, the background information on animal production is analyzed to explain the growth of animal production in from 2000 to 2010. The third part highlights the potential domestic market for expansion of animal production in the coming years. The low level of financial investment in the agriculture sector (including animal production) is emphasized in the fourth section. Finally, some conclusions related to the rural credit supply and animal production are presented.

2.1. Rural credit in Vietnam

2.1.1. An overview

The innovation period initiated in 1986 and in particular the land law issued in 1988 have led to a radical transformation of the agriculture sector in Vietnam. In addition, the government of Vietnam also formulated the Hunger Eradication and Poverty Reduction Plan in the early 1990s, in which credit was considered to be one of the strategic tools. Since the innovation period began, the acceptance of private family farms as the principal unit of agricultural production and the gradual introduction of rural non-farm enterprises resulted in a rapid and sustained increase in agricultural production for both the domestic and export markets (consisting mainly of rice, coffee, pepper and cashew nuts). The drive to obtain and expand the full potential of the agriculture sector has in turn increased pressure to establish a viable, market financial system for rural farms and enterprises. The increased demand for financial services in rural areas quickly led to the establishment of new specialized institutions predominantly directed towards servicing rural populations. In response to the increase in demand for credit, the government of Vietnam provided credit either through the channel of traditional banking system, the Vietnam Bank for Agriculture and Rural Development (VBARD), through a subsidized policy lending institution, the Vietnam Bank for Social Policies (VBSP), or through targeted preferential loan programs. VBARD and VBSP became the dominant providers of financial services to the low-income population, and used the extensive network of political mass organizations¹ to mobilize, appraise, and monitor clients (BWTP 2008).

¹ Socio-political organizations, especially the Vietnam Women's Union (VWU), became an important partner of the credit projects run by the banks, international organizations and national programs. The VWU successfully implemented many microfinance programs due to the depth and scale of its network, especially in rural areas, and the commitment of its staff. However, this collaboration with sociopolitical organizations also came with its own challenges. VWU cadres may lack the appropriate skills to run a sustainable microfinance program. Priority may be placed more on number of clients rather than on quality of loans (Lan and An, 2005).

In Vietnam, the majority of the poor live in rural area. Therefore, the rural finance sector plays an important role in providing financial services for the poor. In Vietnam, rural financial providers can be grouped into the following three main categories: formal sector, semi-formal sector and informal sector (Marsh et al. 2004; Lan and An 2005). The formal sector includes VBARD, VBSP and People's Credit Funds (PCFs). The semi-formal credit sector includes microfinance institutions. The informal sector has been the traditional provider of credit in rural areas, as the result of an underdeveloped formal credit market (Marsh et al. 2004). The key milestones of Vietnam's rural finance policies in the period 1998–2012 are presented in Table 2.1.

Table 2.1. Key milestones of Vietnam’s rural finance policies

Years	Events
1988	Vietnam Bank for Agriculture (VBA) was established to provide financial services for agriculture and rural sectors
1991	CEP – the first microfinance institution (MFI) type was established by the Labor Confederation of HCM City
1992	TYM – a type of MFI, was created by the Vietnam Women’s Union
1993	People’s Credit Funds (PCF) network was started after the collapse of the entire Credit Cooperative System in the hyper-inflation period before innovation in 1986
1995	The Bank for the Poor was established within VBA
1999	Decision No. 67/1999/QD-TTg, credit policy for agriculture and rural development dated March 30, 1999
2001	Decree No. 48/ND-CP of the government for improving the organization and operation of PCFs
2002	The Vietnam Bank for Social Policies (VBSP) was established by separation of operations, the commercial banking put under VBA and social banking under VBSP
2003	The Vietnam Bank for Agriculture was transformed into the Vietnam Bank for Agriculture and Rural Development (VBARD) with full banking services
2005	New decree No. 28/ND-CP dated March 8, 2005 of the government on the organization and operation of microfinance institutions (MFIs) released with ADB support
2007	Amendment of Decree 28 above by Decree No. 165/ND-CP dated July 11, 2007
2008	Resolution No. 26-NQ/TW, dated August 5, 2008 of the Party Congress on three critical rural issues: agriculture, farmers and rural sector. One resolution is to “continue to provide favorable credit to the rural sector, and encourage financial institutions to lend to the rural sector”
2009	The National Microfinance Steering Committee was formed to assist the prime minister in policy and strategy formulation to develop a market -based microfinance sector
2009	Decision No. 497/QD-TTg of the prime minister dated April 17, 2009 on providing interest support for farmers within the demand stimulus package
4/2010	Decree No. 41/ND-CP dated April 12, 2010 on credit policy for developing the agriculture and rural sector, allow non-collateral loans of up to 50 mil.VND to farmers, 200 mil.VND to non-farm households and 500 mil.VND to cooperatives/business farms
6/2010	The new Credit Institution Law (CIL) was released to replace its earlier version, which incorporates MFIs into the formal financial system and liberalizes banking operations, including rural finance
8/2010	TYM - The first microfinance institution was formalized to become a formal credit institution
07/2012	Decision No. 852/ QD-TTg dated July 10, 2012 on strategy for operation of the Vietnam Bank for Social Policies for the period 2011–2020

Source: (ADB 2010; Tam 2011) and author’s summary.

Table 2.2. Outstanding loans of financial sectors to household borrowers

Sources	Outstanding loans (bil.VND)			Growth rate (%)		
	2001	2006	2010	2001–2006	2006–2010	2001–2010
Formal sector						
- VBARD	38,070	105,951	21,1525	16	19	21
- VBSP	6,194	18,525	89,462	21	48	35
- PCFs	3,288	11,381	20,634	23	16	23
Semi-formal sector						
-MFIs	58	315	1409	32	45	42

Source: (VBSP 2004; PCFs 2005; VBARD 2005; PCFs 2010; VBARD 2010; VBSP 2010; Mix Market 2012).

Formal, semi-formal and informal credit providers operate together in the rural credit market in Vietnam. In the period 2001–2010, the annual growth rate of outstanding loans of VBARD, VBSP, PCFs and MFIs were 21%, 35%, 23% and 42%, respectively. The growth of outstanding loans of all credit sources was the result of the implementation of a series of credit policies in this period. The informal sector obtained a higher growth rate due to an increase in the number microfinance institutions. Among the three credit sources in the formal sector, VBSP had a higher annual growth rate resulting from the expansion of some new credit programs.

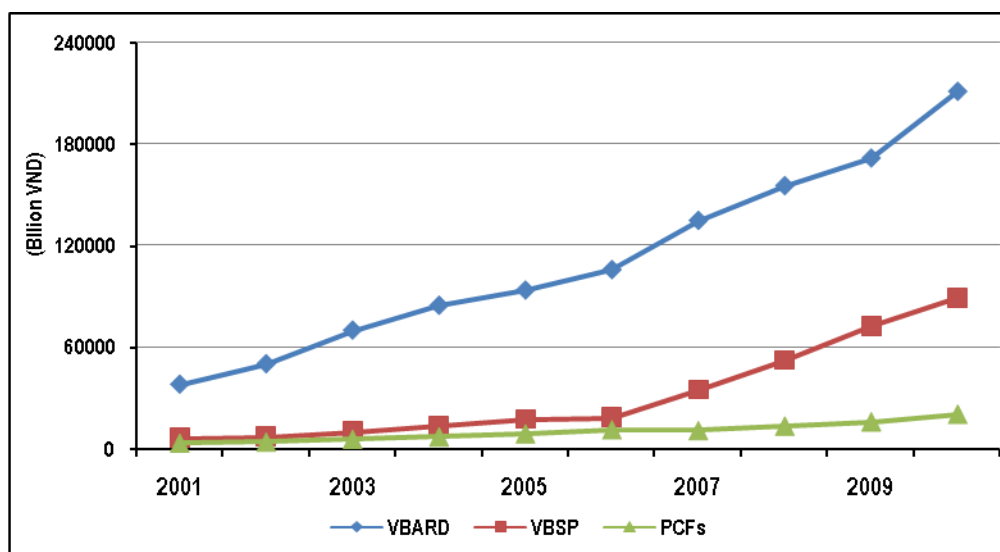


Figure 2.1. Outstanding loans of main formal suppliers to household borrowers

Source: (VBSP 2004; PCFs 2005; VBARD 2005; PCFs 2010; VBARD 2010; VBSP 2010)

It should be emphasized that the inflation rate in Vietnam was 4% in 2002, 9.5% in 2004, 23% in 2008 and 11% in 2010. The upward trend of the inflation rate in recent years significantly affects the outstanding loans and interest rates of commercial banks. The Law on the State Bank of Vietnam stipulates that the State Bank of Vietnam is responsible for managing instruments of monetary policy such as refinancing and interest rates (Article 15 of the Law on the State Bank, 1998). This is to take place through the use of indirect monetary instruments such as the interest rate on the inter-bank market and refinancing conditions and terms. In the period 2000–2010, the relatively high growth rates of outstanding loans from the formal and informal sectors indicate the expansion of the credit supply in both sectors in response to Vietnam’s rural economic development policy and the adjustment of credit supply in relation to inflation rate.

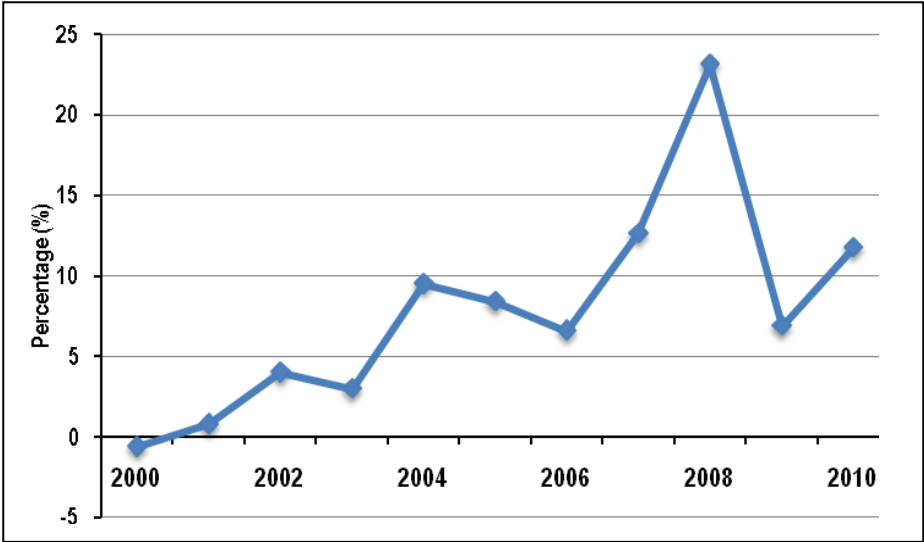


Figure 2.2. Inflation rate in Vietnam

Source: GSO (2010)

The formal sector has been the main credit provider in the rural credit market. Within the formal sector, VBARD and VBSP were the dominant credit providers. The outstanding loans of VBARD accounted for 59% in 2001 and 63% in 2010. Those of VBSP were 6% in 2001 and 30% in 2010. The outstanding loans of semi-formal sectors occupied only 0.4% in 2001 and 1% in 2010.

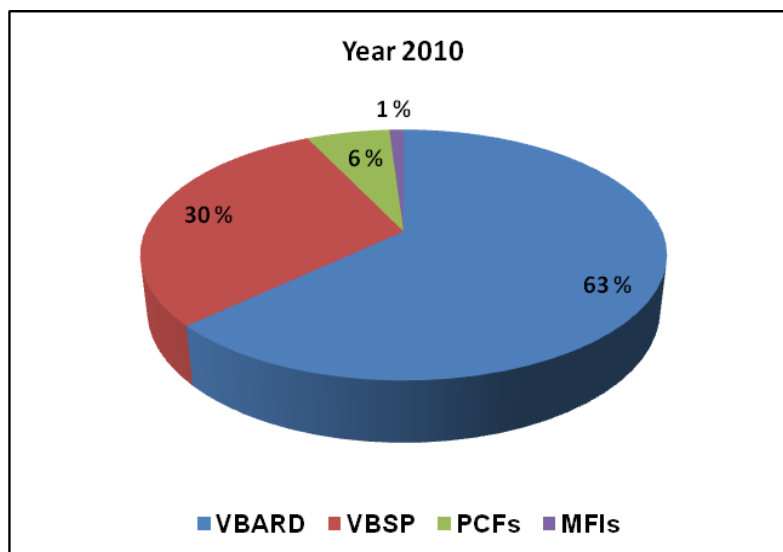


Figure 2.3. Proportion of outstanding loans of main sources to household borrowers

Source: (PCFs 2010; VBARD 2010; VBSP 2010; Mix Market 2012)

Table 2.3. Household borrowers in Vietnam

Sources	Number of household borrowers (1,000s households)			Growth rate (%)
	2001	2006	2010	
Formal sector				
-VBARD	5,000	10,000	17,305	15
- VBSP	2,571	4,696	8,166	14
- PCFs	808	1,099	1,680	9
Semi-formal sector				
- MFIs	38	147	286	25

Source: (VBSP 2004; PCFs 2005; VBARD 2005; PCFs 2010; VBARD 2010; VBSP 2010; Mix Market 2012)

The number of borrowers from VBARD was the highest, followed by VBSP and PCFs. MFIs supplied credit to a small number of borrowers. In 2000, of total borrowers, the proportion of borrowers from VBARD, VBSP and PCFs were 59%, 31% and 10%, respectively. In 2010, the proportion of borrowers from VBARD, VBSP and PCFs accounted for 63%, 30% and 6% of the total number of borrowers. In the period 2001–2010, the growth rate of borrowers of VBARD and VBSP was significantly higher than that of PCFs (Table 2.3). VBSP obtained the second-highest growth rate of number borrowers, because the objectives of VBSP were to provide small loans and to reach a high number of borrowers. The increasing number of borrowers from the formal sector resulted from the expansion of credit programs, responding to Vietnam’s economic development policy.

2.1.2. The formal sector

➤ Vietnam Bank for Agriculture and Rural Development (VBARD)

The Vietnam Bank for Agriculture and Rural Development, formerly named the Vietnam Bank for Agriculture, was established in 1988 with the reform of the financial system and the reintroduction of commercial banks in Vietnam. VBARD is a state “policy” bank and by law a legal entity having universal banking functions with a major focus on the agricultural sector and rural areas, and responsible for its own finance and operations. By the end of 2001, VBARD had become the leading commercial bank in Vietnam, with the most extensive network of branches in rural areas.

Since 1999, VBARD has been given responsibility to implement Decision No. 67/1999/QD-TTg respecting the credit policy for agriculture and rural development and dated March 30, 1999. This policy guideline states that loans below 10 mil.VND do not require collateral if the applicant is sponsored by sociopolitical organizations, including the Vietnam Women’s Union, Farmers’ Union, Youth’s Union and Veterans’ Union. In contrast, in order to get a loan over 10 mil.VND, borrowers usually use land use certificates called ‘green books’ or ‘red books’² as collateral. The land use certificate can bear only one loan, even if the loan amount is less than the value of the certificate. Since 2003, VBARD has transferred its poverty-reducing lending activities to the VBSP, although the bank is still implementing credit lines funded by international donors through Official Development Assistance (ODA) as well as the other government-directed credit programs.

Table 2.4. Outstanding loans of VBARD in overall whole economy and to household borrowers

Outstanding loans to	Outstanding loans (bil.VND)			Growth rate (%)		
	2000	2006	2010	2000–2006	2006–2010	2000–2010
Economy	41,804	186,330	414,755	35	22	26
Household	28,698	105,951	211,525	30	19	22

Source: (VBARD 2005; VBARD 2010)

² Land is owned by the state in Vietnam. Nevertheless, in 1993 the renewal of the law was completed and since then, the government allocates land use certificates to farm households, the so-called ‘red books’ for agricultural land (valid for 20 years) and, since 1999, ‘green books’ (valid for 30-50 years) for forest land. Farmers are allowed to sell, rent, or pass land use certificates on to their children.

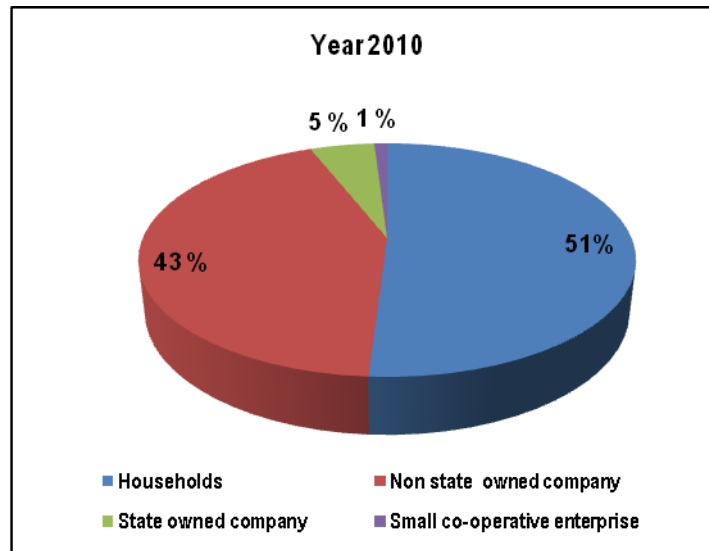


Figure 2.4. Outstanding loans of VBARD by sector

Source: VBARD (2010)

At the end of 2005, the network comprised over 2,000 branches and a staff of some 29,000, accounting for 40% of total bank staff nationwide. At the end 2010, the bank had an operating network of 2,300 branches and transaction offices nationwide. VBARD expands its branches to every district. VBARD specializes in lending to rural households and small-scale enterprises involved in agriculture or off-farm enterprises, but the bank has recently expanded its urban branch network to capture the market of urban small enterprises (BWTP 2008).

By late 2010, the total outstanding loans to the economy reached 414,755 bil.VND, 51% of which was supplied to household borrowers, amounting to around 17 million households. Loans granted to non-state owned companies, state-owned companies and small cooperative enterprises came to 43%, 5% and 1%, respectively (Figure 2.4). In addition, of the total of outstanding loans, those to household borrowers in 2000, 2006 and 2010 accounted for 68%, 57% and 51%, respectively. However, from 2000 to 2010, the growth rate of outstanding loans to the overall economy (26%) was relatively higher compared to that of household borrowers (22%), (Table 2.4).

In response to Resolution No. 26-NQ/TW dated August 5, 2008 of the Central Committee of the Communist Party on agriculture, farmers and rural areas, the government issued Decree No. 41/2010/ND-CP on credit policies for agriculture and rural development. The goals of the decree are as follows: Firstly, creating proper mechanisms and policies to encourage credit institutions to extend their credit to agriculture and rural areas in accordance with commercial lending mechanisms with appropriate interest rates. Secondly, further facilitating clients to get easy access to bank loans by simplifying procedures, reducing disadvantages of clients and pursuing assistance policies for those farmer borrowers at risk due to force majeure reasons (such as natural disasters and epidemics). Thirdly, acting as a legal framework for the political system and society as a whole to join the banking sector in enhancing the credit provision to farmers and rural areas. Under Decree No. 41/2010/ND-CP, the important guideline is the mechanism of collateral for loans, defined as: (i) Credit institutions may consider the provision of loans to customers with or without asset security under current regulations. (ii) Credit

institutions shall clearly define the levels of loans without asset security, conditions and procedures for providing such loans to each borrower in compliance with current provisions of law on credit institutions' provision of loans to customers. Particularly for customers that are individuals, households, business households in rural areas, cooperatives and farm owners, credit institutions may consider providing them with loans without asset security at the following levels: - Up to 50 mil.VND for individuals and households engaged in agriculture, forestry, fishery or salt production; - Up to 200 mil.VND for households carrying out business or production activities or providing services for agriculture and rural areas; - Up to 500 mil.VND for cooperatives and farm owners. (iii) Credit institutions consider providing trust-reliant loans for individuals and households on the basis of guarantee by sociopolitical organizations in rural areas under current regulations. Sociopolitical organizations shall coordinate and perform all or some of the credit operation stages after reaching agreement with the lending credit institutions. (iv) Based on the particularities of loans in the field of agriculture and rural areas, credit institutions shall guide in detail simple and convenient procedures for loan security for borrowers.

There is a problem with this policy as it stands. Borrowers without collateral must submit their land use certificates (for those with such certificates) or written certifications from the commune-level People's Committee if they have not yet been granted a land use certificate and if their land is dispute-free. Customers may only use such written certifications to take out loans at a single credit institution and bear responsibility before the law for the use thereof for loans without asset security under the decree. VBARD is a commercial bank aiming to increase its business profit. Thus, the issue of a non-collateral loan maximum of 500 mil.VND for business farm is a big issue.

➤ **Vietnam Bank for the Poor**

The Vietnam Bank for the Poor (VBP) was established in 1995 to provide subsidized loans to poor households. Up to 2002, VBP did not have its own local branches. Its lending was conducted as part of the transactions of VBARD. When Decree No. 78/2002/ND-TTg and Decision No. 131/2002/QĐ-TTg (both dated October 4, 2002) announced the establishment of the Vietnam Bank for Social Policies (VBSP), the government decided that VBSP could have its own branches at the provincial and district levels. Since then, VBSP has gradually increased its number of branches. By late 2007, there were 64 main branches in the country, 588 sub-branches at the provincial and district levels and a staff of over 6,000 countrywide.

The primary goal of VBSP is to provide preferential credit to poor households, as well as people and organizations eligible for social benefits and policies. VBSP closely cooperates with local organizations at the commune level (i.e. Women's Union, Farmers' Union, Veterans' Union and Youth Union). Local organizations usually help VBSP identify who the poor are and help the bank monitor the loans. From 2001 to 2010, VBSP's credit coverage had been expanded throughout the country. Its outstanding loans and number of borrowers grew annually at 35% and 14%, respectively. By late 2010, VBSP's total outstanding loans reached 89,461 bil.VND, 14 times higher compared to that in 2001.

Table 2.5. Proportion of outstanding loans by credit program

Unit: Percentage

Credit programs	2004	2010
Production and business of poor households	82	40
Job creation	14	6
Education for students	1	29
Safe water and rural sanitation	1	8
Housing construction with deferred payment	1	3
Migrant workers to go abroad	1	1
Households in extremely disadvantaged areas	0	11
Other	0	2
Total	100	100

Source: (VBSP 2004; VBSP 2010)

With regard to credit programs, the programs supplied by VBSP depend on the target programs for poverty reduction decided by the government of Vietnam. The targeted beneficiary and purpose of the loan supply is defined differently. The type of credit program has been more diversified. The number of credit programs was 10 in 2004 compared to 18 in 2010. Presently, the first credit program targeted to poor households aims to support their production and business and improve their living standard, contributing to implementation of the National Target Program on Hunger Eradication and Poverty Elimination. Secondly, the credit program for students targets persons whose families are categorized as poor households. This aims to provide loans for their tuition fees to study in universities or colleges. Thirdly, the credit program for households in extremely disadvantaged areas targets households living in remote areas with poor infrastructure and challenging climate conditions. Its purpose is to develop their production and businesses in order to improve their incomes and reduce the gap in living standard among different areas of the countries. Fourthly, the credit program for safe water and rural sanitation targets poor households and aims to implement the national strategy on clean water supply and environmental sanitation in rural areas for improving living conditions. Fifthly, the credit program for job creation is to support poor households and small business enterprises to create jobs and reduce the unemployment rate. Sixthly, the credit program for housing construction with deferred payment is to support households in flood-prone areas of the Mekong River Delta, enabling them to construct their houses on credit or support households in other regions when they need to be resettled in designated residential groups. Seventhly, the credit program for overseas migrant workers is to help create jobs and to increase incomes, improve the qualification of employees, increase the volume of remittances coming back to the country. The other credit program aims to support employees under drug rehabilitation programs, in forestry protection, etc.

With respect to the interest rate, aiming at providing the poor with preferential treatment, the government tried to make cheap credit available in order to assist the poor to develop their own production and business operations. The State Bank of Vietnam determines the interest rate for credit. This means that banks are not able to set interest rates that will cover the costs

of making loans, operating costs and risks. Since August 2000, the mechanism of pegged interest rates has been applied to all formal financial institutions, instead of a ceiling interest rate. This liberalization of the interest rate gives financial institutions a little more freedom in determining the rates on lending and saving (Putzeys 2002). From 1999 to 2001, the loan interest rate of VBSP was around 1% per month, significantly lower compared with that of VBARD. Further, there was a larger gap between the average market loan interest rate and VBSP's lending rate. In 2003, the annual lending interest rate of the market was 10.8% while that of VBSP was only 6.0%. That means that VBSP subsidized 4.8% of the lending interest rate for the poor (World Bank 2004).

Although VBSP has become the major source of formal loans to poor households, at the current interest rate of lending and within the institutional structure, the bank cannot afford the cost of financial or institutional sustainability. The low interest rate leads to a demand exceeding the loan supply (Putzeys 2002). In addition, the prime minister has issued Decision No. 579/QĐ-TTg dated May 6, 2009 on supporting the lending interest rate for VBSP's loans disbursed from May 2009 to December 2009. In general, the interest rate has been reduced by 4% since May 2009. For example, the annual interest rate on loans for agricultural production and off-farm jobs was reduced from 7.8% to 3.8% since May 2009, while the annual interest rate in Vietnam was 10.5%. This indicates that VBSP has continuously provided subsidized credit for the poor, whereas the development strategy of VBSP is directed towards financial sustainability. The VBSP is developing a transition strategy for the bank to achieve full sustainability in the long-term. This strategy is influenced in part by the experiences of Bank Rakyat Indonesia (World Bank 2004).

In the first stage (by the year 2010), VBSP tried to reach the poor with government subsidies as it would take an extended period of time to transit the operation of the bank towards non-subsidized lending. In the second stage (by the year 2021), the bank would achieve operational sustainability allowing it to cover its operational expenses, but it would not yet achieve a financial profit because of the lending operations policy it must continue to undertake. It is foreseen that the need for such subsidized lending policy will diminish rapidly during this period if Vietnam continues its current path of high economic growth and development. In the third stage (by the year 2028), all policy-based lending will be phased out and the bank will achieve full financial sustainability.

The transition from a subsidy-dependent bank to an operationally sustainable bank will require changes in regulations, bank operations and a mindset change within the borrowing populations. Furthermore, the bank also needs external assistance to shorten the duration of its preliminary three-stage business strategy (World Bank 2004).

➤ **People's Credit Funds**

After the collapse of the rural credit cooperatives, PCFs were established in 1993. They were modeled on the *Caisse Populaire* system in Quebec, Canada. PCFs have been set up in almost all provinces of Vietnam (although coverage is limited in the northern mountainous areas). One of the most important objectives was to restore public confidence in the formal rural finance system. For psychological reasons, the term "cooperative" has been deliberately excluded from the name of this newly established finance institution. The PCF system has been structured as a member-owned organization, which aims at mobilizing savings from its

members. PCFs are shareholding banks and do not target the poor. And 15 potential founding members are required to set up a PCF. These persons have to be better off since a base capital amounting to 50 mil.VND is required to set up a PCF; and each founding member has to buy minimum shares amounting to 3.3 mil.VND. Once the PCF is registered it aims at recruiting more members (Putzeys 2002). From 2001 to 2010, the credit provision of the PCFs was expanded throughout rural areas. The outstanding loans of PCFs and the number of borrowers grew annually at 23% and 9%, respectively. By late 2010, the VBSP's total outstanding loans reached 20,634 bil.VND with 1,608,000 borrowers.

2.1.3. Semi-formal sector

The semi-formal sector includes microfinance institutions handling programs sponsored by local and international NGOs and those established by sociopolitical organizations. These microfinance institutions are considered “pro-poor” and aim to provide a wider and more appropriate range of financial services than the formal sector. The World Bank estimates that some 57 international NGOs have been supporting microfinance activities in Vietnam (World Bank 2004). In addition, there were two major government-related microfinance institutions: (i) the *Tao Yeu May* (TYM) established by the Vietnam Woman's Union in 1992 and (ii) the Capital Aid Fund for Employment of the Poor (CEP) established by the Labor Confederation in Ho Chi Minh City in 1992. TYM and CEP also represent the two leading microfinance institutions in Vietnam in terms of size and performance. By late 2004, there were microfinance institutions operating in 36 provinces (57%), 132 districts (23%), and 2,900 communes (27%) of the country, reaching a total of 351,000 clients. The average loan amount of microfinance institutions was 1.05 mil.VND. Loan amounts ranged from 200,000 VND to 5 mil.VND. The monthly lending interest rate ranged from 0.9% to 2%. The loan terms varied from 6 to 12 months, but never over 24 months. Loan repayments can be made weekly or monthly. The level of outreach attained by MFIs has been insignificant compared to the VBSP and VBARD. These organizations usually rely on a limited pool of international donor funding in order to expand their operations since they were not legally allowed to access commercial funding until 2005 (Lan and An 2005).

In March 2005, the government of Vietnam issued Decree No. 28/2005/ND-CP to regulate the organization and operation of microfinance institutions. This decree grants microfinance institutions (which are currently operating semi-formally) two years to convert into regulated microfinance institutions, raise the required capital and apply the new legislation to their operations. This decree is considered to be a positive step towards integrating the country's fragmented industry, strengthening its institutional capacity, facilitating its access to commercial funds, and encouraging the adoption of internationally recognized good practices. Nonetheless, this decree raises a number of concerns in a market where subsidized credit and de facto interest-rate controls are pervasive, particularly in the microfinance industry. In addition, the institutional weakness of many of the semi-formal microfinance institutions and limited capacity of the State Bank of Vietnam to implement the decree remain one of the biggest challenges that needs to be addressed (World Bank 2007). Semi-formal financial suppliers, with very few exceptions, have been unable to attain significant scale and sustainability (BWTP 2008).

2.1.4. Informal sector

In the informal sector, there are three different types of credit providers to poor households:

Ho/hui. *Ho/hui* is a popular form of rotating savings and credit associations in Vietnam that have existed for generations but have never been recognized officially. *Ho/hui* are credit and savings groups of 5 to 20 members, established on a voluntary basis by a group of individuals. Each group mobilizes savings from its members and provides loans only to members. Savings can be made in cash ranging from 50,000 VND to 1,000,000 VND on a monthly basis, or in-kind (such as rice for farmers) on a seasonal basis of 4 to 6 months. Decisions on interest rates, membership, and loan amounts are either made jointly by all members, through a bidding process, or solely by the organizer/owner of a *ho/hui* setup. Two common types of *ho/hui* are the “credit” type and the “supportive” type, the former aiming to generate additional income from interest, the latter aiming to facilitate mutual assistance among the participants. There is no official data on the number of *ho/hui* groups that exist, or the total amount mobilized by members.

Relatives, friends and neighbors. Loans from friends and relatives take flexible forms, are normally interest-free and usually depend on the personal relationship between the borrower and the lender, or the income source of the borrower.

Moneylenders. There are three types of private moneylenders. The “traditional” type of moneylending involves lending based on mutual trust, using simple procedures without any written loan contract. Such traditional loans are typically short-term loans of cash, sometimes just for a few days. A second type of moneylending is through pawn shops, which is similar to the first type, but the lender requires the borrower to have assets or land as collateral. The third type of private moneylending is through small-scale traders, input suppliers and marketing agencies in local areas. This type of lending is increasingly common and may be in cash or in kind. The private moneylender is characterized by diverse and flexible operations. Their loans usually are small scale as well as short-term (specified by season or by days). The monthly interest rate ranges from 4% to 10% (Lan and An 2005).

2.1.5. Some characteristics of rural credit market in Vietnam

Firstly, under Decision No. 546/2002/QĐ-NHNN enacted by the State Bank of Vietnam on May 30, 2002, since 2002, commercial financial institutions have been free to negotiate their interest rates with their clients, but interest rates are still capped at a maximum of 150% of the prime interest rate published by the State Bank of Vietnam to guide commercial lenders. The formal sector led by VBARD has been evolving to cover an increasing share in the rural credit market. VBARD’s given interest rates are determined within the interest rate framework specified by the State Bank of Vietnam. This exogenously predetermined interest rate policy significantly affects the business of the banks. As Hoff and Stiglitz (1993) pointed out, interest rates can function as an indirect screening mechanism for lenders to select borrowers. Therefore, the banks tend to overcome this situation by employing other devices to screen applicants. This will be analyzed in more detail at the household level in Chapter 5.

Secondly, VBARD is the state-owned bank and has the main responsibility of providing credit to rural areas in order to meet the credit demand of rural households as well as to facilitate agricultural production. However, the State Bank of Vietnam also allows VBARD to provide credit in urban areas and include enterprises and companies in its customer base. Commercial banks may not find the rural market very attractive when they can promote their resource mobilization more quickly in urban areas (World Bank 2007). Lending in rural areas is more difficult than in urban areas. Lending for agricultural production is more risky than for non-agricultural production. These problems commonly influence the lending behavior of VBARD in rural areas.

Thirdly, the government of Vietnam has maintained subsidized interest rates as part of a policy to ensure equitable growth, redistribution of wealth and poverty alleviation. Interest rates on VBSP loans are heavily subsidized and subject to close government control. On the positive side, it has been pointed out that subsidized interest rates imply that the psychological barrier of poor households towards taking out a loan is lowered. The provision of subsidized interest rates has for a long time been a point of discussion between the donor community and the government of Vietnam. The donor community points to international experience with subsidized rural credit programs in less developed countries, which has resulted in massive loan losses, low savings mobilization and heavy losses to both governments and international donors. In addition, subsidized credit programs have been found to lead to lackluster market discipline.

Fourthly, there is a segmented credit supply in the rural financial market in Vietnam, as exhibited in Figure 2.5. The extremely poor and economically active poor benefited from VBSP, a subsidized credit source. Low-income rural households seem to find it more difficult to access credit from all credit suppliers in rural Vietnam.

Fifthly, in Vietnam the lack of competition between the formal and semi-formal rural financial institutions directly relates to the government's policies and preferences as implemented through government-controlled financial institutions. This becomes evident through the key characteristics of the three most dominant institutions, VBARD, VBSP and PCFs (Kovsted et al. 2003). Subsidized lending as currently conducted by VBSP already creates a disincentive for commercial banks and microfinance institutions to enter the rural and microfinance markets (World Bank 2004). The lack of competition will have adverse effects on financial sector performance and development, including limited financial innovation, lack of incentives to reduce costs and poor quality of services.

Sixthly, to secure loans without physical collateral, both VBARD and VBSP firstly have a nationwide network down to the village level. And their loans imply the full support of rural mass organizations, including political and administrative organizations, particularly loans from VBSP.

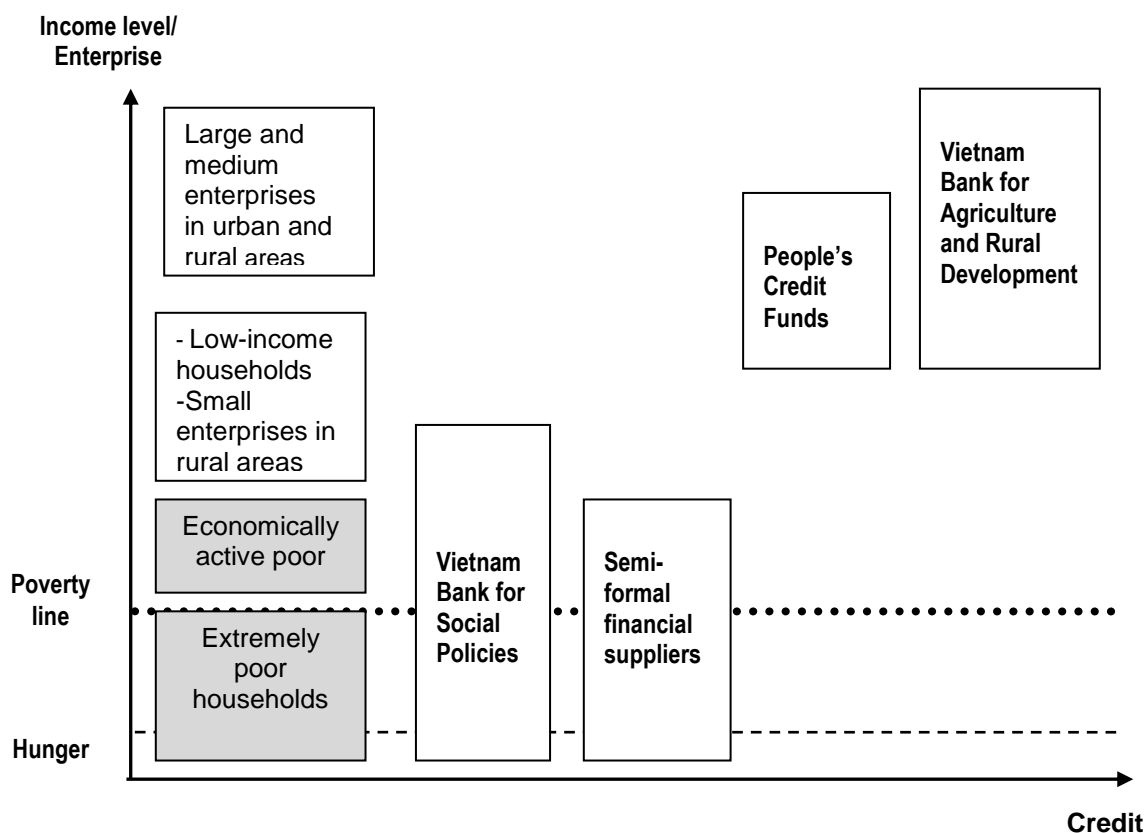


Figure 2.5: Segmented rural credit market in Vietnam

Source: Author's summary

2.2. Overview of animal production in Vietnam

According to the General Statistics Office of Vietnam, agriculture and aquaculture are two subsectors of the economy. The agriculture sector consists of crop production, livestock production and services. Aquaculture includes fishing, both fish captured and fish produced. Both livestock and aquaculture play an important role in their contribution to GDP and job creation for farmers. In Vietnam, livestock production mainly provides products for domestic consumption while the products of aquaculture are mainly for export. In this study, the surveyed farmer households engage in both livestock production and fish production. Therefore, the words “animal production” is used to refer to livestock production and fish production generally. In the following part, livestock production is analyzed to provide key information on animal production in Vietnam and the potential domestic market for this subsector.

Vietnam is an agricultural country with a population of 87 million habitants. About 71% of the country's population lives in rural areas and depends on agriculture production. According to the General Statistics Office of Vietnam, the agriculture sector includes crop production, livestock production and services (e.g. trading in fertilizers, herbicides, pesticides, crop growing and animal husbandry). Crop and livestock production are two main subsectors in

agriculture. Livestock production consists of pigs, poultry, buffaloes, cattle and milk cows. From 2000 to 2010, the gross output of livestock increased significantly, reaching about 36,508 bil.VND in 2010, two times higher than in 2000. Livestock production has become an important subsector in agriculture. The major determinant of growth of livestock is the rapid income growth associated with it and a change in diet patterns, particularly in urban areas, as city dwellers move from staples such as rice to higher value and protein-rich foods. Of the total gross output of agriculture, the proportion due to livestock accounted for 19% in 2000 and reached 24% in 2010 (Table 2.6).

Table 2.6. Gross output of livestock and other subsectors (at 1994 prices)
Unit: bil.VND

Subsectors	2000	2005	2010
Crop growing	90,858	107,897	129,382
Livestock	18,482	26,050	36,508
Services	2,748	3,107	3,612
Total	112,088	137,055	169,503

Source: GSO (2010)

The growth rate of gross output of livestock and that of other subsectors in some periods are shown in Table 2.7.

Table 2.7. Growth rate of gross output of livestock and other subsectors (at 1994 prices)
Unit: Percentage

Subsectors	2000–2004	2004–2007	2007–2010	2000–2010
Crop growing	5.4	2.7	3.8	3.7
Livestock	8.0	8.0	7.8	7.3
Services	3.2	2.6	3.3	2.6
All subsectors	5.8	3.6	4.6	5

Source: GSO (2010)

From 2000 to 2010, livestock production achieved the highest annual growth rate (7.3%) compared to crop production (3.7%) and services (2.8%). However, the annual growth rate of livestock production was unstable. The annual growth rate of the gross output of livestock was 8.1% in the period 2000–2004, 7.5% in the period 2003–2007 and 7.8% in the period 2007–2010. The main reason for this fluctuation was livestock production being affected by a weakness in production management and market management, including uncontrolled animal epidemics, fluctuation of the price of production inputs and the selling price of meat.

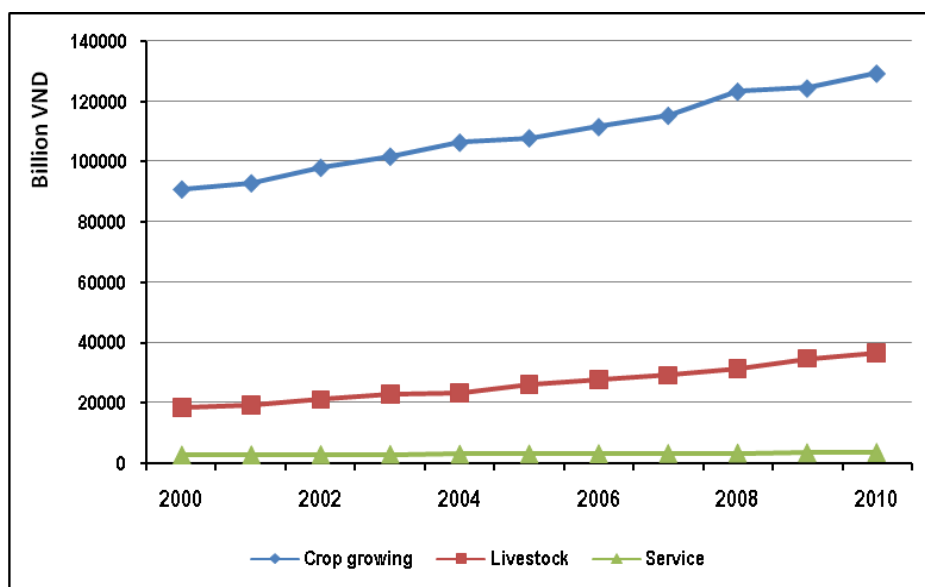


Figure 2.6. Gross output of livestock and other sectors (at 1994 prices)

Source: GSO (2010)

With regard to animal population, there was a difference in the annual growth rate according to type of livestock. There was a reduction in buffalo numbers. In rural areas of Vietnam, buffaloes were widely used as draft power for land tilling up to 2000. Draft animals have been rapidly replaced by machines since 2000. Although the domestic demand for meat and milk has been increasing, the annual growth rate of poultry, pig, cattle and dairy cow husbandry fluctuated year by year. For example, the annual growth rate of poultry flocks was 3.6% in the period 2001–2004; it declined to 1.2% in the period 2007–2010 and then reached 8.3% in the period 2007–2010. The reason for the fluctuation of poultry flocks is the same as above.

Table 2.8. Annual growth rate of livestock herds

Unit: Percentage

Type	2001–2004	2004–2007	2007–2010	2001–2010
Poultry	3.6	1.2	8.3	4.0
Pig	8.9	0.6	1.0	3.0
Buffaloes	0.2	0.8	-1.0	0.0
Cattle	6.0	11.0	-4.0	3.7
Dairy cows	39.0	1.0	6.4	13.0

Source: GSO (2010)

As exhibited in Table 2.9, the total quantity of meat exceeded 4.2 million tons in 2010, two times higher than in 2000. The increased quantity of livestock products resulted from a higher animal population and improvement in livestock productivity. The introduction of imported breeds of pigs has contributed substantially to the increase in livestock productivity in Vietnam.

Table 2.9. Domestic supply of live weight meat in 2000–2010

Commodities	2000		2005		2010	
	Volume (1,000s tons)	Per. (%)	Volume (1,000s tons)	Per. (%)	Volume (1,000s tons)	Per. (%)
Poultry	293	16	322	12	528	14
Pork	1,418	76	2,288	81	3036	78
Buffalo	49	3	560	2	79	2
Beef	94	5	142	5	263	6
Total	1,904	100	3,010	100	4,213	100

Source: GSO (2010)

Presently, pig production has become the dominant source of meat from livestock production. Virtually all Vietnamese households consume it. Of the total quantity of meat supplied by domestic sources, pork accounted for more than 70%. Poultry was the second most important source of meat, accounting for 4%. However, livestock production in Vietnam suffers from animal epidemics due to poor husbandry practices. As a result, the total quantity and proportion of each type of meat varies from year to year. The proportion of poultry meat fell from 16% in 2000 to 12% in 2005, and then increased to 14% in 2010 (Table 2.9).

2.3. Potential domestic market for expansion of livestock production

2.3.1. Lower consumption of livestock products in Vietnam

The real GDP per capita grew an average of about 6% per year during the period 2000–2008 (GSO 2010) and is expected to continue on an upward trend (World Bank 2008), while household final consumption expenditure grew at an average of about 11% per year during the period 1997–2007 (World Bank 2008). Dietary patterns are increasingly shifting from a predominantly starch-based diet to one with a relatively high proportion of animal-sourced proteins, fruits and vegetables.

Recently, meat consumption by Vietnamese people has increased sharply, because of the rapid improvement in household living standards (Tuyen et al. 2004). In Vietnam, the annual meat consumption per capita was 16 kg in 2000 and up to 29 kg in 2010. It was still lower than that of several other Asian countries.

For example, in Taiwan the annual meat consumption per capita was 76.5 kg in 2000 and 69.8 kg in 2010. Similarly, in South Korea, this figure was 45.4 kg in 2000 and 59.2 kg in 2010. The gap in meat consumption between Vietnam and several other Asian countries indicates the high potential market for domestic consumption and expansion of livestock production.

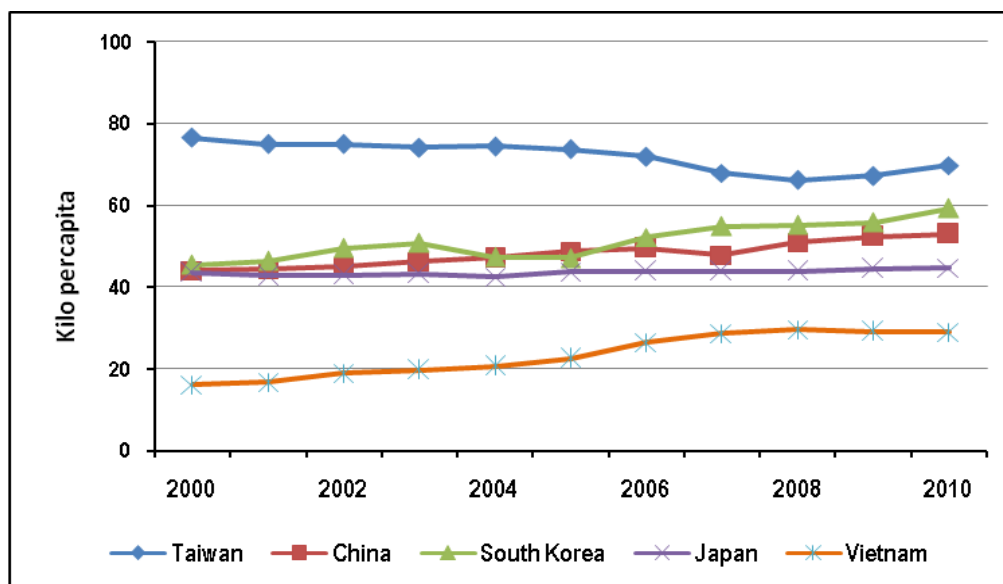


Figure 2.7. Annual meat consumption in some Asia countries

Source: (FAPRI 2011)

2.3.2. Growing domestic supply vis-à-vis increasing demand for meat

Although Vietnam more than doubled its meat supply since 2000, the rate of increase has been slow since 2005. This is further evidenced by a decline in the growth rate of the gross output index of meat from domestic sources since 2005. The yearly rate of change of this index is shown in Table 2.10. It can be seen that between 2000 and 2005 the annual growth rate of meat production from domestic livestock tended to rise. It peaked in 2005, and since then has declined.

Table 2.10. Annual growth rate of gross meat output from domestic sources (at 1994 prices)

Year	Change (%)	Year	Change (%)
2000	6.6	2006	7.6
2001	3.1	2007	3.9
2002	8.6	2008	7.5
2003	8.6	2009	10.9
2004	6.0	2010	4.0
2005	12.8		

Source: GSO (2010)

Despite continual growth since 2000 of the volume of Vietnam’s meat production, meat prices have escalated in recent years, as evidenced by Table 2.11, which shows the values of the Vietnam meat producer index from domestic sources. Note that the producer price indices measure the real prices which producers receive for their products, taxes and levies being excluded.

Given the rising value of this index, it can be concluded that the demand for meat in Vietnam has risen at a faster rate than its supply (Tisdell 2009). In the period 2000–2008, the increase of the meat price from domestic animal sources was greater than that of all other agricultural products. However, the rising real price increased at a much faster rate than Vietnam’s average consumer price index (Tisdell 2009). The price index for meat from Vietnamese producers, shown in Table 2.11, demonstrates the meat price escalation.

Table 2.11. Price index for meat from Vietnamese producers
(at 1995 prices)

Year	Index value	Rise from 1995 (%)
1995	100	-
2000	113	13
2002	120	20
2004	132	32
2005	133	33
2006	133	33
2007	152	52
2008	243	143
2009	244	143
2010	248	148

Source: GSO (2010)

2.3.3. Persistence of strong Vietnamese consumer preference for fresh meat

The demand for meat is increasing faster than the domestic supply. Some kinds of meat have to import to meet the domestic demand (including beef, broiler chickens and pork). Beef is ranked as the highest volume import. Net imports of beef were 28,000 tons in 2005 and climbed to 259,000 tons in 2010. Broiler chickens were ranked as the second highest volume import. The net import of broiler chickens was 25,000 tons in 2006 and reached 215,000 tons in 2010. Vietnam imported pork some years. Net pork imports amounted to 30,000 tons in 2008 and 26,000 tons in 2009 (BMI 2011; FAPRI 2011).

Over recent decades, beef production in Vietnam has developed positively. There has been a dramatic increase in beef meat production, which is mainly due to numerous support strategies under the cattle development program for the whole country. However, increasing consumer demand, mainly in urban areas, has required imports of large quantities of beef from outside to fill the shortfall. According to GAIN (2006), Vietnam’s economic development led to a steady increase in income per capita, which has encouraged consumer spending. As a result,

Vietnamese's per-capita meat consumption is increasing as well, including a higher demand for beef. Despite increasing demand, beef consumption per capita is still low. Dac (2002) indicates that the country is importing a significant volume of high quality meat. Beef is the highest quality of meat imported by Vietnam and it is expected that beef importing will continue to grow to meet local demand, especially in big cities due to low domestic cattle and buffalo meat production in the country and limited resources, particularly for grazing (GAIN 2006).

Apart from the rapidly growing demand for meat in Vietnam due to its economic growth, the strong preference of Vietnamese households for fresh meat is a major factor. As a result, virtually all of the increased demand for meat has to be met from domestic supplies. This provides considerable natural market protection for Vietnam's domestic meat production. Vietnamese consumers have a strong preference for fresh meat, and an aversion to chilled, frozen or processed meat (Lapar et al. 2009; Tisdell et al. 2009; Lapar and Toan 2010).

This preference is explained by the following reasons: (i) Vietnamese consumers do not like to buy meat from supermarkets and prefer to buy it from traditional market outlets; (ii) they avoid imported meat because it is, of necessity, chilled, frozen or used in processed meat products. Thus, most consumers demand domestically sourced fresh meat. They buy meat frequently and do not store it for long time; (iii) these tastes probably result in pig, poultry and other animals being slaughtered close to retail markets and in limited transport of meat from rural areas to large cities.

2.3.4. Livestock production creating income for rural households

According to Steinfield and Mack (1997), livestock production contributes a great deal to rural development. Livestock husbandry has positive effects on the diet, health, income, financial security, sustainable crop yields, employment opportunities, and social status of households (ILRI 2003). Subsequently, raising livestock is a way to enhance the economic viability and sustainability of a farming system (Steinfield and Mack 1997). Livestock production contributes not only to rural growth but also to poverty reduction and improvement of livelihood among resource-deprived farmers because livestock development often benefits the poor (De Haan 1995; Devendra and Thomas 2002).

The poverty analysis and assessment carried out by the World Bank (1999) reports that although Vietnam has witnessed an overall significant reduction in poverty, poverty levels still remain relatively high. Poverty in Vietnam, as in many other developing countries, is found to be strongly connected with location, households located in rural areas being more likely to be poor. Approximately 90% of the poor in Vietnam reside in rural areas and 80% of poor households are farm-based. Poverty in Vietnam also has marked regional characteristics and among the regions, poverty is clearly higher and deeper in the upland regions. Maltsooglou and Rapsomanikis (2005) indicated that livestock plays an important role as an income source in the livelihoods of agricultural-based households. Livestock income is derived mostly from the sale of animals. Livestock-specific policies that aim at improving market integration and production efficiency of livestock might prove effective when targeting the poorest households in rural areas. Table 2.12 provides some information on the production of rural livestock-producing households in Vietnam. The proportion of households keeping livestock

by expenditure quintile in rural areas of Vietnam is ordered by increasing value of GDP per capita at purchasing power parity.

Table 2.12. Rural households raising livestock in Vietnam
Unit: Percentage

Indicators	Rural households by expenditure quintile					All
	1st quintile	2nd quintile	3rd quintile	4th quintile	5th quintile	
Rural households keeping livestock	85	87	83	82	73	82
Proportion of net income from livestock	17	16	17	18	13	16

Source: Ciamarra et al. (2011)

Households with different levels of income have incentives to keep livestock because of the wide spectrum of benefits these provide, such as cash income, food, manure, draft power and hauling services, savings and insurance, and social status and social capital (Bebe et al. 2003; Upton 2004; Moll 2005). As shown in Table 2.12, livestock is maintained across all expenditure quintiles, which is suggestive of the multiple roles of farm animals in the household economy. Livestock contributes to household livelihoods through a variety of direct and indirect pathways (providing income in kind, household consumption, savings, manure, draft power, being a source of wealth to facilitate access to financial services).

In Vietnam, rural households in the second quintile were more likely to keep livestock than those in the bottom quintile. This is consistent with findings by IFAD (2001) for Botswana and Roland-Holst et al. (2007) for Vietnam, who argued that the very poor may lack the resources to invest even in small animals. The contribution of net livestock income to total household net income in Vietnam is also presented in Table 2.12. Livestock income is defined as the value of sales and barter of livestock, plus the value of sales, barter and self-consumption of livestock products (such as milk, meat, eggs, honey, and so forth) minus the expenditures related to livestock production, including feed, labor and veterinary services (Ciamarra et al. 2011). In the aggregate, the direct contribution of livestock to the income of rural livestock-keeping households is still limited, with an average of 16%. It is relatively higher for poor households than non-poor households. These figures, however, do not take into consideration the contribution of livestock to other dimensions of household welfare. The fact that an overwhelming majority of the rural population keeps livestock suggests that increases in the productivity or profitability of livestock will directly contribute to their livelihoods (Ciamarra et al. 2011).

2.4. Low financial investment in agriculture sector, including livestock

In the early 1980s, Vietnam was one of the poorest countries in the world, suffering from food deficit, widespread famine and stagnating per capita income growth. Reform of the agriculture sector was essential to poverty reduction as it is the largest sector of the economy and provides income to some three quarters of the population. Agricultural development has brought Vietnam from a food deficit country to agricultural exporter. Vietnam's rapid economic and social development in the past quarter century has few parallels in economic history. In Vietnam, as in other developing countries, the development strategy has traditionally squeezed agriculture to foster growth in industry (Barker 1993).

Of total GDP, agriculture contributed to 24% in 2000, gradually falling to 20% by 2010. In the same period, the proportion of industry and services in total GDP increased gradually (Table 2.13). Meanwhile, the economic structure of Vietnam has undergone gradual change. But over 60% of the labor force is involved in the agriculture sector. In reality, agricultural growth can provide food security for the country at an aggregate level and make substantial contributions to growth of the rest of the economy. These contributions can come directly through rural savings and foreign exchange earned by exporting agricultural commodities, and indirectly through more efficient operation of the economy.

By the mid-1990s, the government had restored macroeconomic stability, GDP growth had accelerated and the country had become a major exporter of rice, coffee and many other agricultural and industrial products. In 2005–2010, the value of agricultural exporting products occupied about 25% of total value of products exported by Vietnam. This implies that agriculture also plays a significant role as a sector creating export value for Vietnam.

Table 2.13. Contribution of agriculture to total GDP (at 1994 prices) and value from Vietnam's export products

Indicators	2000	2005	2010
Total of GDP (bil.VND)	441,646	839,211	1,980,914
Proportion of GDP (%)	100	100	100
- Agriculture, forestry, aquaculture	24	21	20
- Industry and construction	37	41	40
- Services	39	38	39
Export value of all products (mil.USD)	14,482	32,447	72,236
Export value of agriculture, forestry, aquaculture (mil.USD)	4,197	7,452	16,460
Proportion of export value (%)	30	23	23

Source: GSO (2010)

Despite the very important role of the agricultural sector in Vietnam's economy, this sector has received much less investment from the government budget than other sectors. In 2000, 14% of government expenditure went to agriculture, forestry and aquaculture while the contribution of those sectors to GDP of Vietnam was 24.5%. It should be emphasized that government expenditures in those sectors have been on a downward curve since 2005. It was 6% of government expenditures whereas those sectors contributed 21% to Vietnam's total GDP in 2009 (Anh 2010; Mai 2012). Recently, 60% of Vietnam's labor force is in agriculture. However, outstanding loans of the formal sector to rural areas only accounted for 23% of the total outstanding loans of the whole country in 2009 (Table 2.14).

Table 2.14. Outstanding loans of the formal sector to agriculture, forestry and aquaculture, and the overall economy

Indicators	2000	2005	2009
Whole country (bil.VND)	198,331	655,254	1,753,914
Agriculture, forestry and aquaculture (bil.VND)	53,125	162,124	400,594
Proportion (%)	27	25	23

Source: State Bank of Vietnam (2010) cited in (Ha 2010)

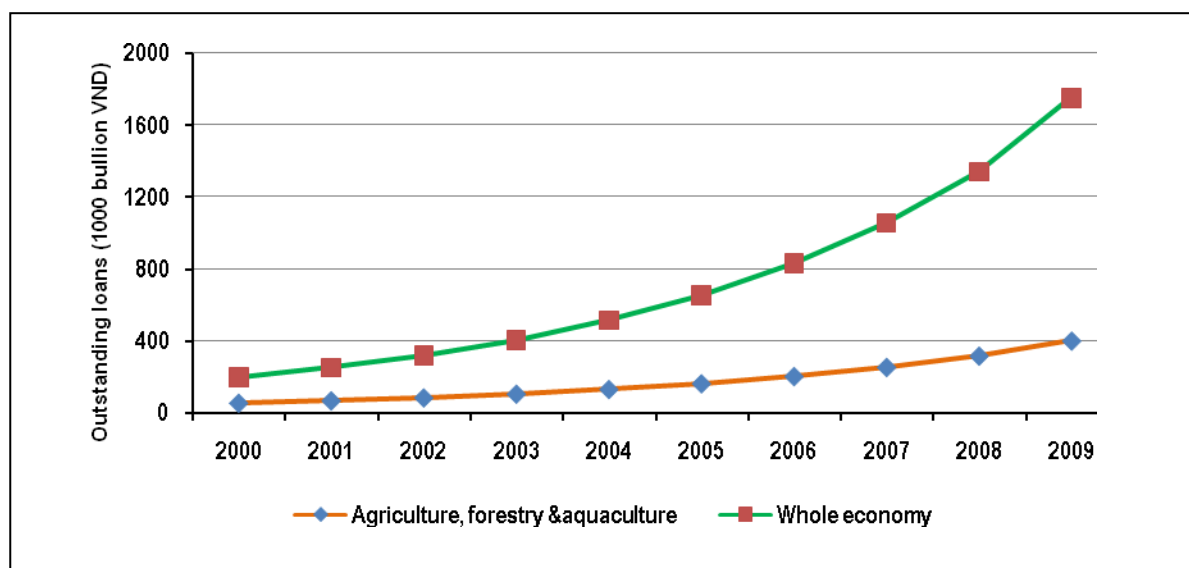


Figure 2.8. Outstanding loans of the formal sector to the agriculture, forestry and aquaculture and to the overall economy

Source: State Bank of Vietnam (2010), cited in (Ha 2010)

2.5. Conclusions

Access to credit is crucial for the development of farmer households. It allows investment in agricultural technologies (seeds, irrigation systems, terrace building, etc.) and bears the potential to increase farm output and income. Recently, the rural credit supply in Vietnam has achieved considerable results, particularly as regards the formal sector. The formal sector has been successful in its outreach to rural areas, represented by an increasing number of borrowers. Some factors leading to this achievement can be listed as follows:

1. A series of rural credit policies has been promulgated in response to the requirements of rural development and the agriculture sector.
2. The land law policy enacted in 1993 creates issuance of land use certificates, which are used as physical collateral to borrow money from commercial banks.
3. The government has pursued its objective of both social and economic development by providing subsidized credit programs to poor households.
4. The involvement of mass organizations and the local authorities has been used to expand the lending network to rural areas. In addition, the lending group method has been applied to supply credit from VBSP to the poor.

Offsetting the achievements of the formal credit sector, some problems exist in the rural credit market. Firstly, lack of competition in the rural credit market is likely affected by the VBSP's subsidized credit programs. Competition from and development of microfinance institutions have been partly affected by such a problem. Secondly, a relatively high number of poor and low-income households still have no access to credit, partly due to the weakness of the rural credit market.

In Vietnam, animal production has played an important role in the growth of the agriculture sector, providing products for domestic consumption and generating income for farmer households. Animal production has grown in recent years. The domestic market requires expansion and improvement of animal production. At the national level, the credit supply to rural areas did not meet the credit needs of rural households, including animal producers. To facilitate the expansion and improvement of animal production, the credit supply also needs to improve in order to meet the credit needs of animal producers in Vietnam.

CHAPTER III : RESEARCH METHODOLOGY

This chapter explains some methods used to analyze the study objectives. The analytical frameworks are designed and explained. In addition, the study sites and surveyed households, data collection, group discussion, in-depth interview and data analysis were selected for application as research methods.

3.1. Analytical framework of the study

In order to analyze current access to credit by animal producing households, the analytical framework is designed as presented in Figure 3.1. The analysis of household participation in the rural credit market is explored for both the formal and informal sectors. Due to some different characteristics of each credit source, analysis of the response of banks to credit needs of farm households only focuses on VBARD and PCFs. The strengths and weaknesses of the formal sector also are identified.

An important feature of the rural credit market in developing countries is that access to credit may be easier for some groups than others. The literature review section shows that credit access commonly relates to the physical, human and social capital of households. In this study, it also aims to highlight the factors that impede or support credit access by animal producing households to the rural credit market in Hai Duong Province, especially the formal sector. Therefore, the capital endowment of households can be considered as a center for analysis (Figure 3.2).

✓ **Physical capital**

Generally, the term physical capital refers to financial assets (savings, income), physical assets (housing and equipment) and natural assets needed to support the household's livelihood. Physical capital can be used as traditional collateral to get credit in the credit market. The absence of physical capital has long been seen as the major access constraint of poor and low-income households. Specifically, in this study, the owned physical capital of animal producing households, including the land use certificate (land ownership), area of fish pond, value of assets and non-farm income is combined in some parts of the analysis to explain the relation between the household's physical capital and credit access.

✓ **Human capital**

At the household level, lack of human capital or weakness of human capital is seen as an access constraint from the household side. A statement of available human capital often needs to be included on application forms for credit, to describe small business plans or to provide sufficient information for the credit application procedure. Moreover, human capital can compensate for a lack of physical collateral. In addition, the decision of credit suppliers to grant credit or not is based mainly on the profitability of the investment, which partly depends on human capital. In this study, the education level of the household head, the age of the household head, number of laborers, family size and dependency ratio are presented as the human capital.

✓ **Social capital / Social network**

The human capital, physical capital and social capital owned by household can be substituted for each other as collateral for borrowing money, but only to a certain degree. For instance, informal lenders, in the absence of physical collateral, have typically used social capital as collateral. Formal lenders mainly rely on physical collateral that can be easily sold in the market. In this study, social capital is analyzed in relation to the social network (social relationships of households and members of local organizations).

✓ **Rural credit policy, strengths and weaknesses of the formal sector**

The rural credit policy, and strengths and weaknesses of the formal sector also relate to the decision to lend money. Having different capital endowments, the response of households to the above factors may differ from household to household. Knowledge about the rural credit policy and strengths and weaknesses of the formal sector also are analyzed in this study.

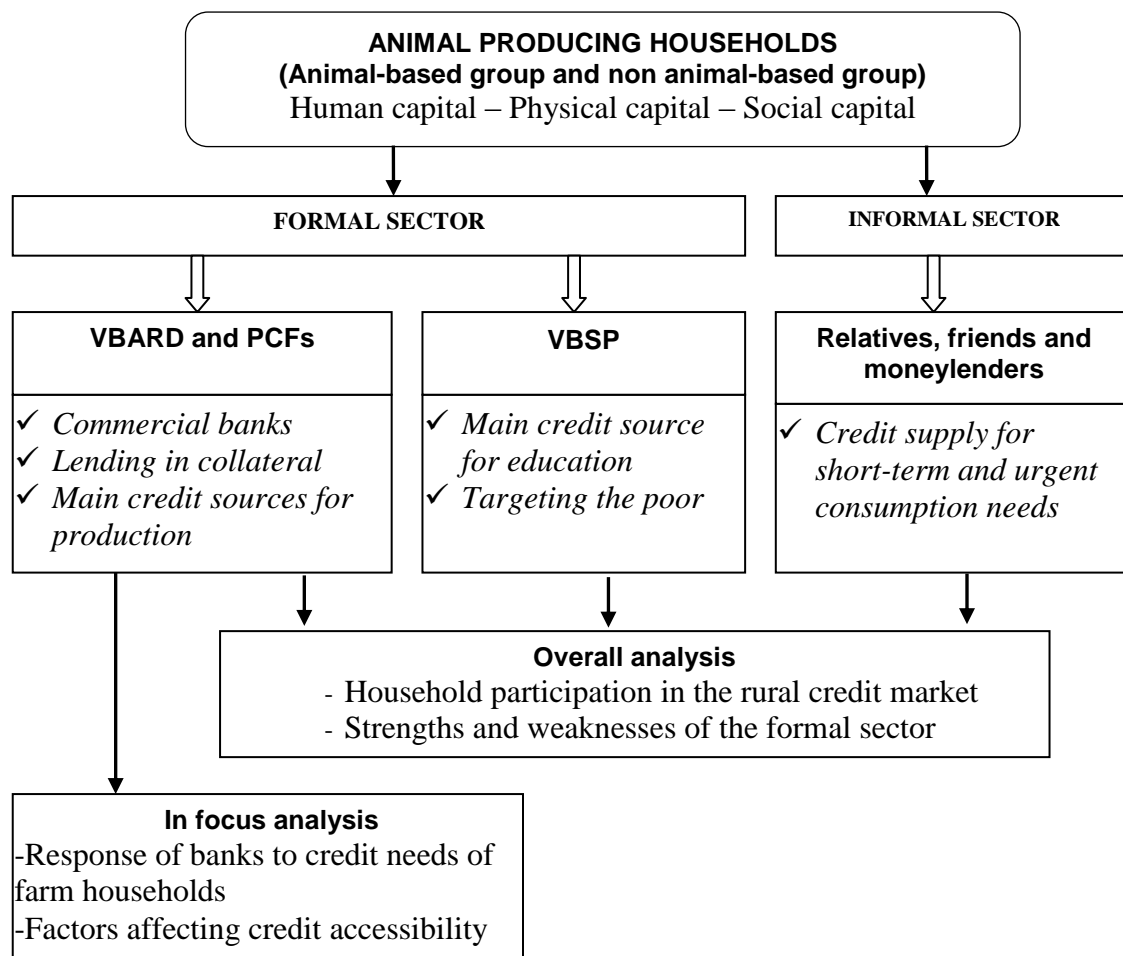


Figure 3.1. Typical characteristics of credit sources and the analytical framework for access to credit by animal producing households

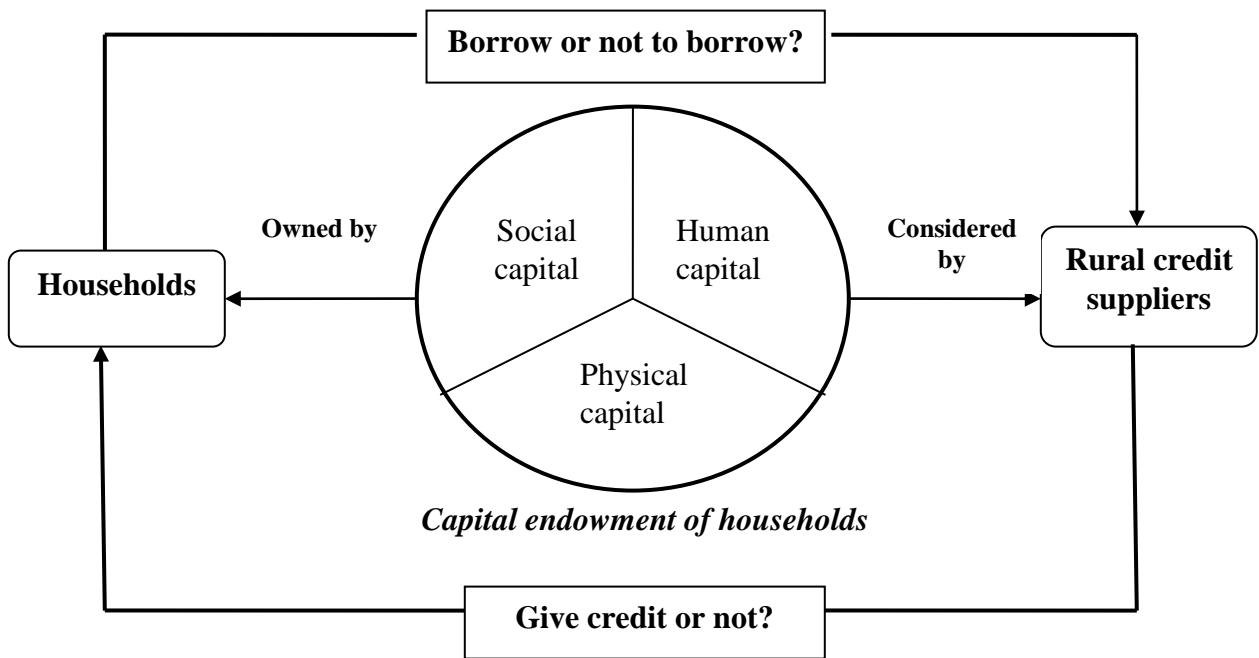


Figure 3.2. Household’s capital endowment and access to credit

Source: Adapted from Dufhues (2007)

Concerning the main constraints to production and marketing and the influence of credit and non-credit factors on animal production, the analytical framework also is designed as shown in Figure 3.3. Overall, the investigation of main constraints to production and marketing, cost and return analysis, household income, family labor use and gender issues are systematically analyzed for the animal-based group, the non-animal-based group and their subgroups. In addition, the influence of credit and non-credit factors on the animal production is explored for the credit constrained groups. The classification of groups and subgroups is mentioned in a later section in the chapter.

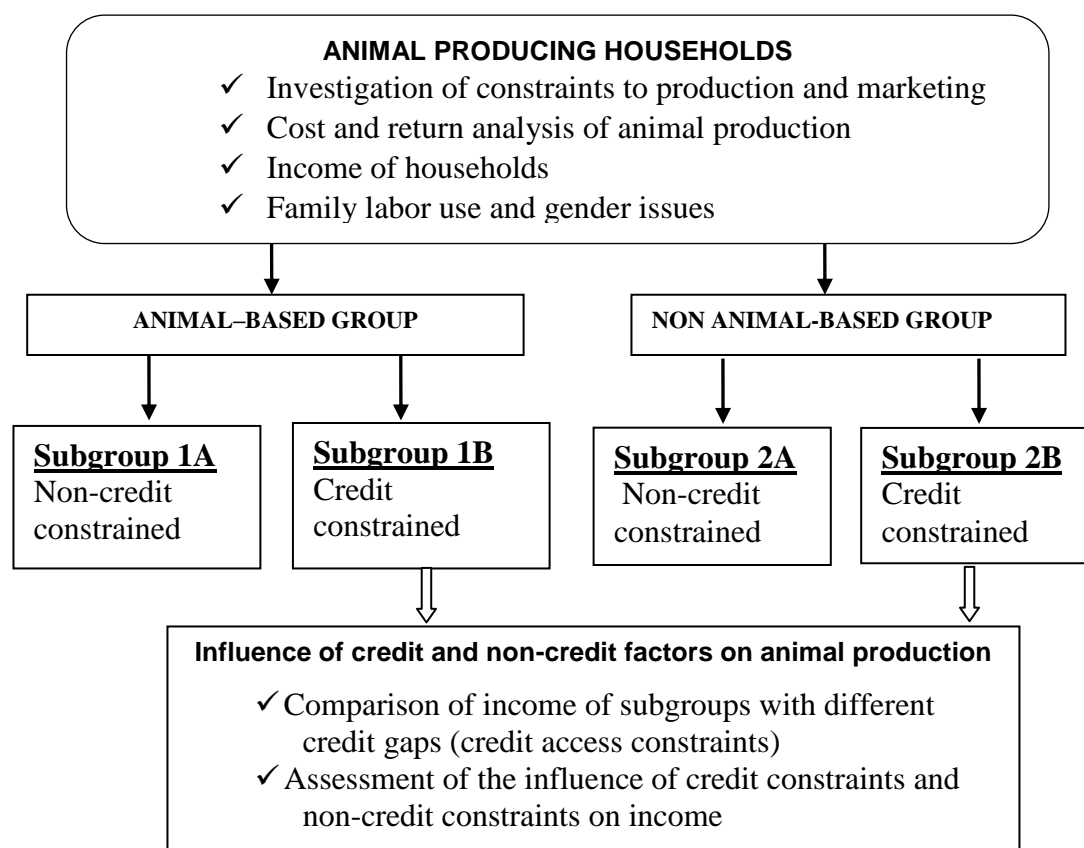


Figure 3.3. Analytical framework for influence of credit and non-credit factors on animal production

3.2. Selection of the study sites and surveyed households

The selection of districts, communes and surveyed households is for the most part based on the framework of the project on “Economic development of farm households toward sustainability.” The procedure of selection of the study sites and the surveyed households is described in the following sections.

The project was carried out in 2008–2011 and was supported by the Women’s Union in Belgium’s Wallonia region. It was implemented by the Hanoi University of Agriculture and the Women’s Union of Hai Duong Province, Vietnam. The main objective of the project was to promote livestock production in farmer households, in expectation of contributing to increasing the income of small-scale livestock producers. The project provides for the transfer of production techniques and veterinary knowledge in pig and chicken husbandry to farmers.

The criteria for the selection of the study sites were as follows: (i) The study site should be representative of the socio-economic characteristics of the Red River Delta region with a high population density and a high proportion of the population living in rural areas; (ii) the selection of the study site must capture the important role of agricultural production in rural household livelihoods.

To achieve the initial objective of the project, Hai Duong Province was selected as the study site for the following reasons: (1) In this province, the rural population occupies a high proportion of the total population. Currently, 80% of the total population of Hai Duong Province is living in rural areas. This figure is higher compared to that of other nearby provinces, such as Vinh Phuc (77%), Bac Ninh (76%) and Hai Phong (53%). (2) The proportion of agricultural labor to total labor has decreased slightly. However, it is still quite high (60% in 2010), which implies that the agriculture sector plays a crucial role in income generation and job creation for rural labor. (3) The poverty rate of Hai Duong Province has declined slightly in recent years. However, poverty still prevails. The poverty rate of Hai Duong Province is 11%, which is higher than that of Thai Binh (9%), Bac Ninh (7%) and Hai Phong (6%) (GSO 2011). (4) The increasing consumer demand for meat and fish, especially of consumers in Hanoi located near Hai Duong Province, is creating a market potential for farmers in the province.

Based on the framework of the study, Chi Linh, Kim Thanh, Cam Giang and Tu Ky districts were selected as representative districts of Hai Duong Province. It is realized that in those districts people working in the agriculture sector account for a high proportion of the total labor force in each district. In 2010, the proportion of agricultural labor to total labor was 87% for Chi Linh, 86% for Kim Thanh, 72% for Cam Giang and 86% for Cam Giang (HDSO 2011).

Then, the selected communes were representative of the characteristics of each district. Finally, the 145 households who engaged in the project were randomly selected for data collection. The selection of districts, communes and surveyed households is presented in Table 3.1.

Table 3.1. Selection of study sites and surveyed households

Selection	Criteria	Sources of information	Sample selection
Province and districts	<ul style="list-style-type: none"> - Representative province of the Red River Delta region - Existence of poverty - Access to market and extension services - Responding to the project's objectives 	<ul style="list-style-type: none"> - Official statistics of the province - Local authorities at province and district levels 	Four districts in Hai Duong Province <ul style="list-style-type: none"> - <i>Cam Giang</i> - <i>Chi Linh</i> - <i>Kim Thanh</i> - <i>Tu Ky</i>
Communes	<ul style="list-style-type: none"> - Representative commune - Important role of agricultural production 	<ul style="list-style-type: none"> - Unit statistics at districts and communes 	<ul style="list-style-type: none"> - <i>Cam Hoang</i> - <i>Chi Minh</i> - <i>Ngu Phuc</i> - <i>Dan Chu</i>
Households	<ul style="list-style-type: none"> - Involvement in animal production - Participation in the project 	<ul style="list-style-type: none"> - Staff of local originations - Village heads 	145 households

3.3. Data collection

✓ Secondary data

The secondary data was collected from different sources, including the yearly statistics book published by the Vietnam General Statistics Office, Hai Duong Statistics Office and statistical data from local commune offices. Besides, the data on credit supply at the district and provincial levels were supplied by the State Bank of Vietnam, the Vietnam Bank for Agriculture and Rural Development, Vietnam Bank for Social Policies and People's Credit Funds in Hai Duong Province. The secondary data describes the province's formal sector agricultural production and credit supply.

✓ Primary data

The primary data were collected to obtain information on household characteristics, credit access, production, etc. Both qualitative and quantitative primary data were gathered by such research activities as household surveys, group discussions and in-depth interviews. The detailed procedures of the household survey, group discussion and in-depth interview are presented in the following parts.

3.4. Household survey

As mentioned, the study site was straightforwardly selected based on certain criteria. Of 198 households participating in the project, 145 households were randomly selected. In other words, both straight and random methods were applied to select the surveyed household. Using the structured and semi-structured questionnaire, two rounds of the household survey were conducted. The first round was carried out in the early months of 2011. The surveyed households were asked to provide information on their access to credit and animal production in 2010. Information on the household survey includes: (1) basic demography of the household: family size, number of members in the labor force, age and education level of the household head, possession of land use certificate, social relationships of the household head, membership in organizations; (2) physical and other assets: cropland area, pond area, equipment and machines for production and business, livestock shelter, housing and durable assets; (3) credit access: number of loans, amount of loans received, sources of credit, interest rates, term of loan, transaction costs, collateral, advantages and disadvantages of each credit source; (4) loan use, interest payment and repayment of very short-term loans; (5) crops, livestock, fish production, non-farm activities, costs, value of production output, needed working capital for livestock and fish production; (6) main constraints of animal production and marketing, assessment of household regarding credit and non-credit factors contributing to low income; (7) income and consumption expenditure.

It was found that very short-term loans from the informal sector were repaid in the year 2010 and the lending terms of loans from the formal sector were commonly more than one year. Therefore, to collect information on the household's repayment of all loans taken out in 2010, the second round of household surveys was conducted in 2012.

3.5. Group discussion

The group discussion was employed to identify constraints to animal production and marketing and to investigate of the farmer's assessment of the strengths and weaknesses of the formal sector.

✓ Group discussion for identification of constraints to animal production and marketing

It is realized that credit is one of the factors related to animal production. Before the household survey, 12 farmers living in Dan Chu commune were invited to discuss and identify main constraints to production and marketing. The internal and external reasons leading to main constraints were also explained. This was useful to design the household survey questionnaire and to highlight the negative influences of credit constraints and non-credit constraints on income from animal production.

It should be noted that investigation of the main constraints to production and marketing, using group discussion in Dan Chu commune, included the survey questionnaires to verify as well as fully collect constraints to production and marketing from all surveyed households. That is why group discussion about such problems was only organized in Dan Chu commune.

✓ Group discussion of the strengths and weaknesses of the formal sector

To identify the strengths and weaknesses of the credit supply from some sources, the group discussion also was organized in Cam Hoang commune on June 2011. Ten farmers, including households with credit access and without credit access, were invited to indicate their opinion or assessment related to the credit supply from VBSP, VBARD and PCFs, along with credit access constraints. It should be explained that the VBSP, VBARD and PCFs simultaneously supplied credit to rural households. There, group discussion of the strengths and weaknesses of the credit supply was conducted as a typical case. In addition, verification of the strengths and weaknesses of the credit supply was also done during the household survey.

3.6. In-depth interviews

In-depth interviews were employed to understand more deeply (i) the opinion of local staff of the Women's Union, Farmers' Union, Veterans' Union and Youth Union regarding the credit supply at the commune level in rural areas of Hai Duong Province; (ii) information about animal feed prices, animal output prices; (iii) detailed information from some farmers about their credit access, the role of animal production in female labor, etc. The household survey was conducted in four communes. Each commune has a Women's Union, Farmers' Union, Veterans' Union and Youth Union. All heads of such unions in the four communes were invited for in-depth interviews.

3.7. Classification of surveyed households

Most of the surveyed households engaged in integrated animal production, including poultry, pigs and fish. Their production facilities varied in scale. The ratio of annual income from animal production to total household income was selected as a criterion to classify the surveyed farmer households into two groups, the animal-based group and the non animal-based group.

The animal-based group obtained an annual income from animal production accounting for over 50% of total household income. It was less than 50% for the non-animal based group. The purpose of this classification is to explore differences in credit accessibility between two groups.

Furthermore, within each group, households were grouped into two subgroups, including the non-credit constrained group and the credit constrained group. Some criteria for classification are presented in Table 3.2.

Table 3.2. Classification of surveyed households

Animal based group		Non animal-based group	
<i>More than 50% of annual income from animal production</i>		<i>Less than 50% of annual income from animal production</i>	
<u>Subgroup 1A</u> Non-credit constrained	<u>Subgroup 1B</u> Credit constrained	<u>Subgroup 2A</u> Non-credit constrained	<u>Subgroup 2B</u> Credit constrained
<i>Criteria for classification</i> - No need to borrow money - Approval for full required amount of loan	<i>Criteria for classification</i> Lack of money due to: - Having credit need, but did not apply for loan - Loan application rejected - Approval for part of required amount of loan	Similar indicators as those of Subgroup 1A	Similar indicators as those of Subgroup 1B

3.8. Data analysis

Both descriptive statistics and econometrics were used to analyze the data for the households surveyed. Descriptive statistics were employed, in which the Student's t-test, analysis of variance (ANOVA), Fisher (F) test, Duncan test and Chi-square test were used. Mean, percentage and standard deviation were calculated as indicators reflecting credit access, cost and return analysis of animal production, income from certain activities and analysis of the influence of credit and non-credit factors on income from animal production. The Student's t-test assesses whether the means of two groups are statistically different from each other. In addition, analysis of variance (ANOVA) is a collection of statistical models used to analyze the differences between group means and their associated procedures (such as "variation" among and between groups). The F-test, used in ANOVA, provides a statistical test of whether or not the means of several groups are equal, and therefore it generalizes the t-test to more than two groups. After obtaining a significant F test from ANOVA, it should know that which means contributed to the effect and which groups are particularly different from each other. The Duncan test is used in conjunction with ANOVA to find means that are significantly different from each other. On another hand, the chi-square statistic (χ^2) was used to test the fit between the theoretical frequency distribution and a frequency distribution of observed data for which each observation may fall into one of several classes.

The estimation of factors affecting credit accessibility was explored, using the econometric model. The SPSS software was used for the descriptive analysis. In addition, the STATA software was used to support the econometric method.

✓ Analysis of access to credit

Some indicators associated with access to credit by households include the number of households that applied for credit, the number of borrowers, the number of households without credit, the size of loans, the approved loan amounts and interest rates. The credit gap ratio was also estimated.

During the household survey, farmers were asked: (i) Given the current size of their pig herd, poultry flock, current area of fish pond, where applicable, how much working capital they needed (including cash, feed inventory and credit). Did they need to invest in variable production inputs to achieve their expected productivity (pig, poultry and/or fish)? In other words, given their current scale of animal production, how much working capital did they need to satisfy their expenditure on variable production inputs to obtain their expected productivity? (ii) After the loan was received, how much working capital was available for animal production? (iii) Was your available working capital enough to cover your expenditure on animal production? (iv) Of the total working capital needed for animal production, what percentage was made up of your available working capital? Then, using the replies given to the questions, the credit gap ratio was verified and estimated. The credit gap ratio is presented below. The wider credit gap ratio reflects higher credit access constraints. The credit gap ratio was also used to analyze the influence of credit and non-credit factors on income from animal production.

$$\text{Credit gap ratio (\%)} = \frac{(\text{Average amount of working capital needed for animal production} - \text{own available working capital for animal production} - \text{amount of credit received for animal production}) \times 100\%}{\text{Average amount of working capital needed for animal production}}$$

a farm household must overcome an obstacle of participation in the formal credit market before it is observed with a positive loan amount. A household's accessibility to credit can be defined as the ability to borrow from different sources of credit (Diagne 1999; Diagne and Zeller 2001). The previous studies pointed out that exploring the credit accessibility of households, both household characteristics and bank characteristics should be taken into account. Due to bank characteristics, households that have a need for credit may access credit or be frustrated by denial. Therefore, household characteristics and the requirements of credit programs offered by banks, singly or in combination, can work to impact the household's accessibility to credit (Cuong 2007; Li et al. 2011).

Econometrics may be defined as the social science in which the tools of economic theory, mathematics and statistical inference are applied to analyze economic phenomena (Goldberger 1964). Econometrics means economic measurement. Econometrics is primarily interested in the empirical verification of economic theory (Gujarati 1999). In addition, the coefficients, derived from the estimated models, would explain the quantitative correlation between household characteristics and the household's credit accessibility. Regarding the descriptive analysis, it simply enables a separate assessment of each household's characteristics associated with the household credit accessibility. Taking advantage of the econometric model, in this study, firstly the descriptive analysis was employed to identify differences in household characteristics in relation to the household's credit accessibility. The further analysis of the correlation between household characteristics and the household's credit accessibility was implemented by application of the econometric model. It should be highlighted that the auto-correlation between some household characteristics are eliminated to achieve a better estimation model. Therefore, application of the econometric model would tightly identify the factors affecting the household's credit accessibility.

As suggested from previous studies, in this study the Heckman selection model (Heckman 1979) was applied to estimate factors affecting the credit accessibility of animal producing households. The reduced forms of borrowing decision of households to apply for credit from commercial banks (VBARD and PCFs) and the equation for the amount to be borrowed are presented as follow:

$$P_{ij}^* = H_{ij}^p \gamma + u_{ij} \quad (1)$$

$$P_{ij} = \begin{cases} 1 & \text{if } P_{ij}^* > 0 \\ 0 & \text{if } P_{ij}^* \leq 0 \end{cases}$$

$$L_{ij} = H_{ij} \beta + \varepsilon_{ij} \text{ if } P_{ij} = 1$$

$$= 0 \text{ if otherwise} \quad (2)$$

Where: P_{ij}^* is a latent variable. P_{ij} is 1 if households decided to borrow and is 0 otherwise;

L_{ij} is the borrowing amount in mil.VND;

H_{ij}^p and H_{ij} the vectors of household characteristics (the description of estimated variables is presented in Table 5.15);

γ and β are the coefficients to be estimated;

u_{ij} and ε_{ij} are the error terms.

Following the suggestion of Heckman (1979), a two-step procedure was used in this model. The first step aimed to estimate factors affecting the borrowing decision of households. The second step was then to estimate factors determining the loan amount. It was assumed that participation in the formal credit market and the final loan amount obtained by households are independent, i.e. $\rho_{u\varepsilon} = 0$. Therefore, the participation process does not affect the outcome of the loan amount equation (2). In other words, there is no sample selection problem. Hence, β can be consistently estimated by Ordinary Least Squares (OLS) using the selected sample of surveyed households.

In the first step, the Probit equation (1) is estimated by maximum likelihood estimation and the sample selection correction term ($\widehat{\lambda}_{ij}$) was computed (the inverse Mill ratio). In the second step, the equation (2) is estimated by OLS including the correction term ($\widehat{\lambda}_{ij}$) as an additional regressor to correct for selection bias in modeling the sequential decision process of the borrower in the first step. It is assumed that $(u, \varepsilon) \sim N(0, 0, \sigma_u^2, \sigma_\varepsilon^2, \rho_{u\varepsilon})$ for maximum likelihood estimation. The equation (2) can be rewritten as

$$E(L_{ij} | H_{ij}, P_{ij} = 1) = H_{ij}\beta + \sigma_u \rho_{u\varepsilon} \widehat{\lambda}_{ij} \quad (3)$$

A simple presentation of the Heckman model is shown in equations (4) and (5)

- First step (Probit estimation): Estimate factors affecting the probability of credit application of households (or borrowing decision)

$$\text{PROBIT (Credit application)} = \text{Household characteristic variables} \quad (4)$$

- Second step (Regression estimation in the form of Logarithm-Linear equation): Estimate factors affecting borrowing amounts of households approved by VBARD and PCFs

(5)

$$\text{LOGARITHM (Borrowing amount)} = \text{LINEAR (household characteristic variables+ Mill ratio)}$$

It should be noted that in the second step the form of *Logarithm-Linear equation* finally was selected because application of this form created a better regression result than other forms of regression, including the form of *Linear-Linear equation* and the form of *Linear-Logarithm equation* (Appendixes 5 and 6).

✓ **Cost and return analysis**

Cost and return analysis is applied to estimate the cost and income from animal production (i.e. pigs, chickens and fish). Some of following indicators are used for the cost and return analysis (Figure 3.4).

Value added (VA) is the worth that is added to a good or service at each stage of its production or distribution.

Gross output (GO) is the total value of production outputs.

Intermediate cost (IC) includes purchasing variable inputs (materials and services).

Return to family labor is the differences between value added and cost of hired labor, interest payment, taxes, cost of fish pond renting, depreciation.

The value added, gross output and return to family labor are calculated by the following equations:

$$\text{Value addition (VA)} = \text{gross output (GO)} - \text{intermediate cost (IC)}$$

$$\text{Gross output} = \text{production quantity} \times \text{selling price}$$

$$\text{Return to family labor} = \text{value addition} - (\text{hired labor cost} + \text{interest payment} + \text{renting cost of fish pond} + \text{taxes} + \text{depreciation})$$

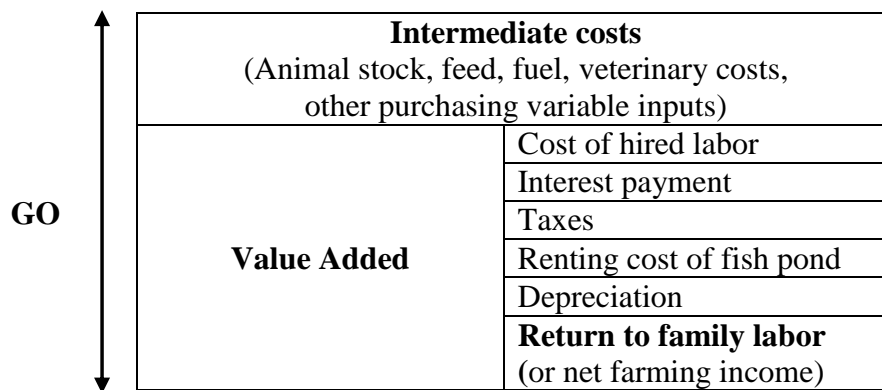


Figure 3.4: Cost return analysis

Source: Derived from (Lebailly et al. 2000; Ton and Huyen 2008)

✓ **Analysis of the influence of credit and non-credit factors on animal production**

Firstly, factors undermining animal production and marketing are explored to identify the main constraints to be overcome. Then, income from crop production, non-farm activities and animal production, income per household and average income per month per capita are calculated to compare income among the different groups. Finally, the influence of credit and non-credit factors on animal production is determined. Some analysis steps are briefly presented in Table 3.3.

Table 3.3. Analysis of influence of credit and non-credit factors on animal production

Steps	Contents	Targeted group	Specific methods
1	- Main constraints to animal production and marketing - Reasons of constraints (internal reasons and external reasons)	- Animal-based group - Non animal-based group	- Group discussion - Household survey
2	- Cost and return analysis - Income of households	<u>Subgroups (1A, 1B, 2A and 2B)</u> in Animal based group and non animal-based group	- Cost and return analysis - Student's t-test , ANOVA and Fisher (F)- test
3	- Influence of credit and non-credit factors on income from animal production	<u>Subgroups 1B, 2B</u> Credit constrained households	- Credit gap ratio (presented in cross table)

CHAPTER IV : GENERAL INTRODUCTION TO HAI DUONG PROVINCE AND PERFORMANCE OF FORMAL CREDIT SECTOR

This chapter aims to provide a general introduction to Hai Duong Province, selected as the study site, and to outline the province's characteristics, especially the agriculture sector. In addition, the performance of the formal credit sector at the provincial level also is described.

4.1. General introduction to Hai Duong Province

4.1.1. Geography and climate

Hai Duong Province lies in the Red River Delta, from 20⁰36 to 21⁰33 latitude and from 106⁰30 to 106⁰36 longitude, neighboring on six provinces: Bac Ninh, Bac Giang and Quang Ninh to the north; Hung Yen to the west; Thai Binh to the south; Hai Phong to the east. Hai Duong has a natural land area of 1,662 km², which is divided into two regions (mountainous region and plains region) based on topography. The mountainous region is in the north of the province, accounting for 11% of the total natural area, comprising 13 villages in Chi Linh district and 18 villages in Kinh Mon district. This is a low mountainous region which is suitable for fruit crops, timber trees and fast-growing industrial trees. The remaining plains region accounts for 89% of the total natural area built up by alluvial soil from Thai Binh River.

The soil is fertile, suitable for various kinds of trees and crop growing with crop rotation year round. In terms of administration, Hai Duong Province has one city, the capital, and 11 districts, including the city of Hai Duong, Chi Linh, Nam Sach, Kinh Mon, Kim Thanh, Thanh Ha, Cam Giang, Binh Giang, Gia Loc, Tu Ky, Ninh Giang and Thanh Mien districts.

Hai Duong Province has a tropical monsoon climate with four seasons (spring, summer, autumn and winter). The annual average rainfall is 1,300-1,700 mm. The average temperature is 23.3°C; hours of sunlight per year are 1,524 hours; the average humidity is 85%-87%. The weather is favorable for agriculture, including vegetable and fruit crops and temperate climate vegetables.

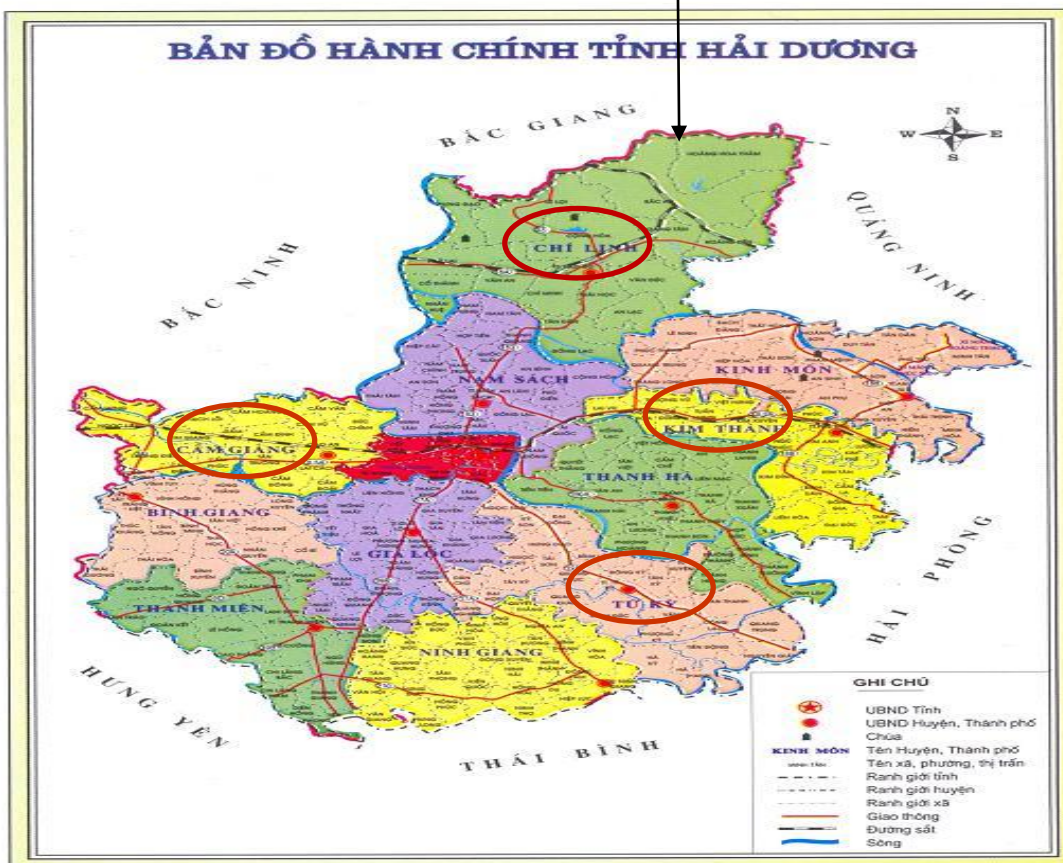
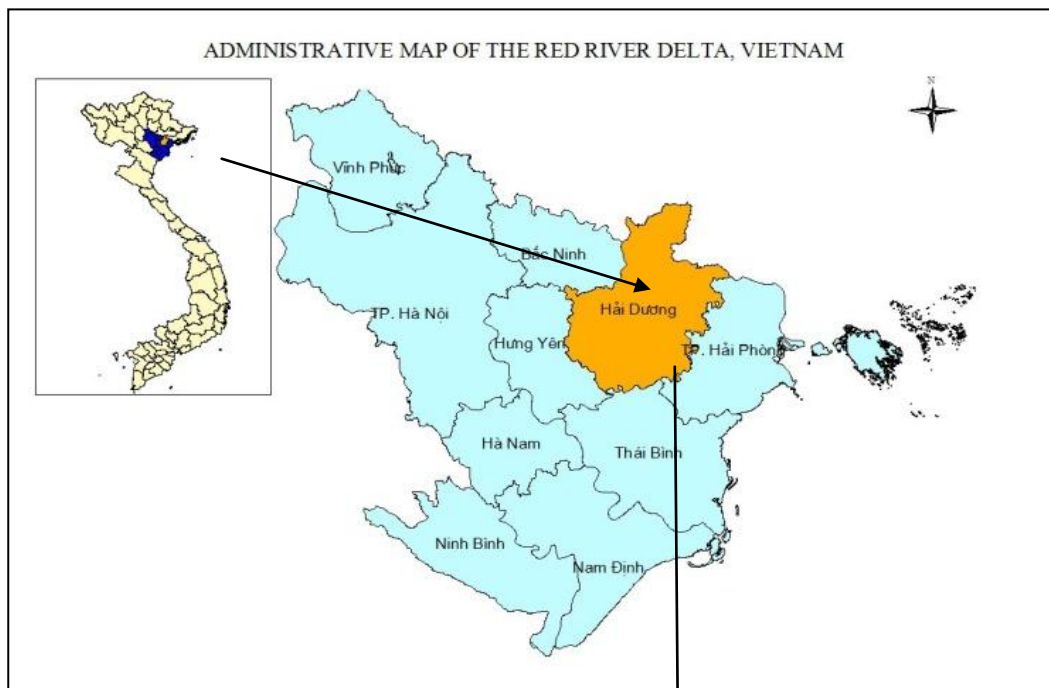


Figure 4.1. Hai Duong Province and geographical location of selected districts
Source: www.haiduong.gov.vn

4.1.2. Population

The population of the province gradually increased from 1,652,000 in 2000 to 1,706,000 inhabitants in 2010. The annual population growth rate in 2000-2010 was about 1%. In 2000-2010, the annual population growth rate of the urban area was 1.04%, slightly higher than in rural areas (0.9%) due to the urbanization process. The city of Hai Duong is the most crowded with the population density of 2,998 inhabitants/km², followed by Gia Loc, Cam Giang and Kim Thanh districts, with a population density of 1,197, 1,176 and 1,065 inhabitants/km², respectively.

In Hai Duong Province, the majority of the population is presently living in rural areas (about 78%). As shown in Table 4.1, in 8 districts (of a total of 11), the rural population accounts for over 90% of the total population, such as Kim Thanh, Tu Ky, Ninh Giang, etc. Growth of the rural population has resulted in much pressure in terms of employment, income generation, food security and agricultural production.

Table 4.1. Percentage of rural population in total population

Unit: Percentage

	2005	2007	2010
Whole province	84	81	80
City of Hai Duong	14	13	19 ¹
Chi Linh	75	71	68
Nam Sach	94	90	90
Kinh Mon	81	80	80
Kim Thanh	96	95	95
Thanh Ha	95	95	95
Cam Giang	88	87	85
Binh Giang	95	95	95
Gia Loc	92	91	90
Tu Ky	96	96	96
Ninh Giang	95	95	95.
Thanh Mien	93	93	92

Source: HDSO (2008) and HDSO (2011)

Note: The high proportion of rural population is due to the fact that some marginal communes belong to the city of Hai Duong.

4.1.3. Infrastructure

Hai Duong Province's infrastructure is rather complete, offering favorable conditions for the socioeconomic development of the province. The transportation network, which includes roads, railways and waterways, is reasonably well-distributed. Some national roads such as Highways 5, 18 and 183 pass through Hai Duong Province. The railway route between Hanoi and Hai Phong via Hai Duong Province is considered as a bridge to connect Hanoi capital to the northern provinces and to the sea. As a province being located in the center of the important economic triangle in the north (Hanoi, Hai Phong and Quang Ninh), Hai Duong has favorable opportunities to share its labor force with the northern provinces, especially to trade goods with other provinces and cities and for export.

4.1.4. Economic structure

In 2000–2010, Hai Duong gained many achievements in economic development. The annual growth rate of GDP was approximately 10% in 2000–2010. The economic structure has changed significantly towards industry, trade and services (Figure 4.2). In 2000, the share of the industry and construction sector, services sector, and agriculture, forestry and aquaculture sectors were 37, 28 and 35% of the provincial GDP, respectively. In 2010, the GDP of the province was 26,194 bil.VND, of which 45% was contributed by the industry and construction sector, 32% by the services sector, and 23% by the agriculture sector. During the last 10 years, the industry and construction sector achieved the highest annual growth rate of GDP (14%), followed by the services sector (11%) and finally the agriculture sector (3%).

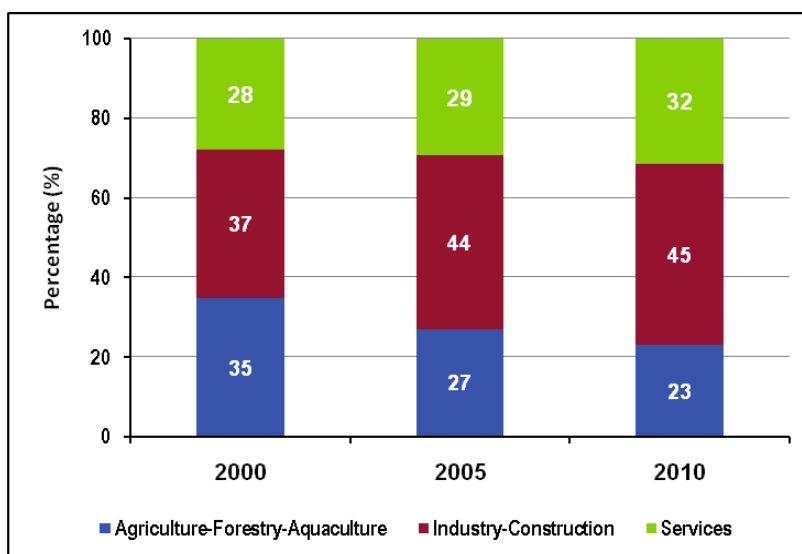


Figure 4.2. Structure of GDP by economic sectors in Hai Duong Province

Source: HDSO (2011)

Regarding the agriculture sector, the GDP annual growth rate and GDP contribution to total GDP of all sectors are at the lowest levels compared with its remaining sectors. Agriculture, however, is an important sector in Hai Duong Province because about 80% of its population is living in rural areas and 60% of the labor force is engaged in agricultural production. Agriculture supplies food for both urban and rural residents, creates jobs and generates income for rural laborers. Therefore, it still plays a crucial role in the economic and rural development of the province.

4.1.5. Agricultural land area

In 2000–2010, the agricultural land area of Hai Duong Province was considerably reduced. The total agricultural land area in 2000 was about 114,000 hectares while it dropped to 106,000 hectares in 2010. The main reason for this reduction in agricultural land is urbanization and industrialization. Recently, agricultural land has been transformed for several purposes, such as road expansion, housing construction and industrial zone expansion. The reduction in agricultural land area has led to a significant change in labor use in the agriculture sector. Annually, laborers working in the agriculture sector have moved to the industry sector and other non-farm activities. The livelihoods of farmer households who lost their land have also changed. The recent reduction of agricultural land and changes in labor use are typical of the agriculture sector in Hai Duong Province.

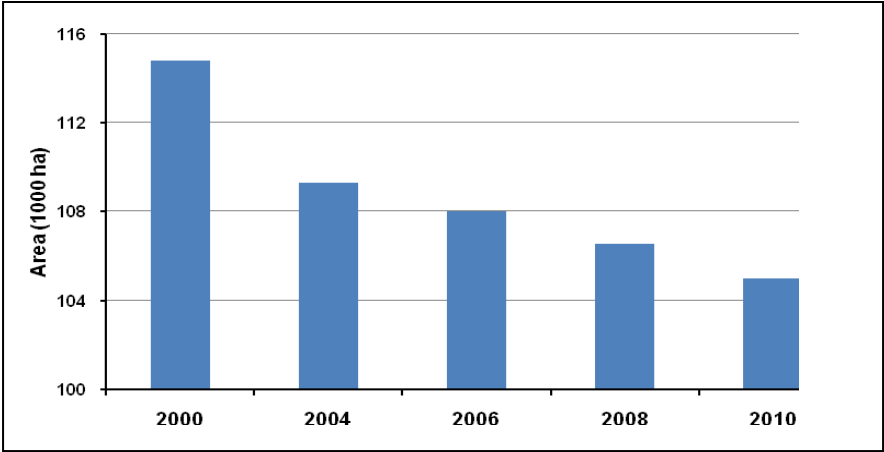


Figure 4.3. Agricultural land area of Hai Duong Province in 2000–2010

Source: HDSO (2011)

4.1.6. Agricultural production

Agriculture includes three major subsectors, namely crop growing, animal production and service. The cultivation consists of annual crop production (rice, maize and vegetable) and fruit (litchi, guava and longan). Animal production includes livestock production (chickens, pigs, and ducks) and aquaculture. On the other hand, agricultural services include land preparation, rice threshing, veterinary services, and the like). As presented in Figure 3.4, cultivation is the mainstay of the total output value of agriculture. Of the total output value, the share of cultivation has dropped slightly, while the share of animal production and services has gradually increased.

Of the total value of agriculture, the share of crop growing was 76% in 2000 but it dropped to 63% in 2010. This is mainly attributed to the lessening of agricultural land area. With regard to animal production, it accounted for 22% of the total output value of agriculture in 2000 whereas its share was 30% in 2010. However, the output value of animal production occupies a small part in the total output value of the agriculture sector. Since the demand for meat, eggs and fish in Vietnam has increased annually, it is necessary to expand animal production in Hai Duong Province.

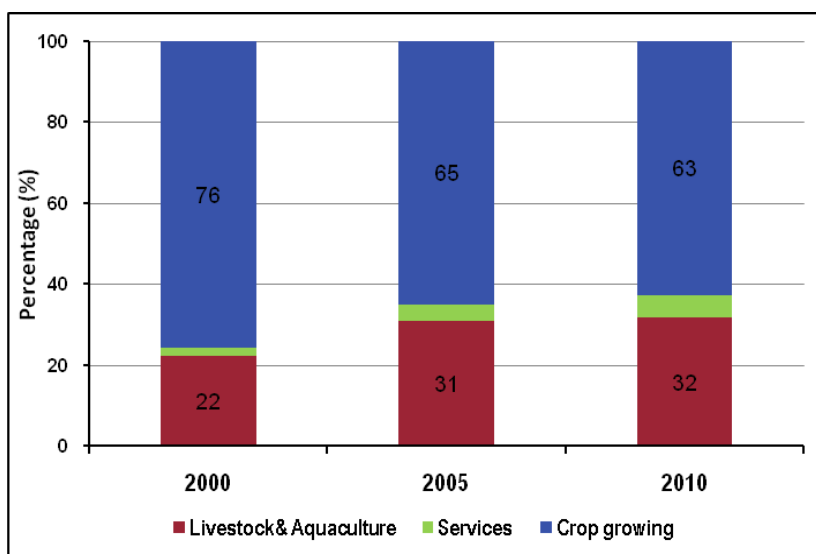


Figure 4.4. Share of crop growing, animal production and services in the total agriculture output (at current prices)

Source: HDSO (2011)

Although animal production has expanded, this subsector has been confronted with many constraints such as disease, rapid increase of feed prices and fluctuation of selling prices.

Regarding disease, in 2007 and 2008 many farmers suffered from the avian influenza outbreak. In addition, in the three first months of 2010, the *porcine reproductive and respiratory syndrome* (PRRS) also attacked pig production. The disease caused losses for many animal producers. Therefore, farmers needed a great deal of credit to overcome their capital constraints. The following section aims to provide key information on the current performance of the formal credit in Hai Duong Province, which is closely related to the objective of the study.

4.2. Performance of the formal credit sector in Hai Duong Province

4.2.1. Introduction to the formal credit sector

In Hai Duong Province, formal credit providers at the provincial level consist of various suppliers, including state-owned banks and joint stock commercial banks, such as Vietcom Bank, Viettin Bank, the Military Bank, Dong A Bank, VBARD, VBSP and PCFs. They belong to the formal financial sector. The VBARD, VBSP and PCFs are formal credit suppliers, providing financial services in both rural and urban areas.

Table 4.2. Outstanding loans of VBARD, VBSP and PCFs in Hai Duong Province

Sources	Outstanding loans (bil.VND)			Growth rate (%)
	2005	2007	2010	
VBARD	1,895	3,330	5,660	25
VBSP	390	601	1,633	35
PCFs	440	815	1,639	31
Total	2,725	4,746	8,932	28

Source: VBARD in Hai Duong (2011), VBSP in Hai Duong (2011) and PCFs in Hai Duong (2011).

In comparison with the remaining banks in Hai Duong Province, VBARD, VBSP and PCFs are major lenders in rural areas. Their outstanding loan portfolios have increased annually. The outstanding loan portfolio of VBARD was 1,895 bil.VND in 2005, and it grew to 5,660 bil.VND in 2010. The outstanding loan figure of VBSP is close to that of PCFs. During 2005–2010, VBSP achieved a high annual growth rate of outstanding loans (35%), followed by PCFs (31%) and finally VBARD (25%). With respect to credit supplier outreach, VBARD is the largest credit supplier compared to the other suppliers. As shown in Figure 4.5, in 2005 the outstanding loan portfolio of VBARD was 70% whereas it was 14% and 16% for VBSP and PCFs, respectively. Presently, the outstanding loan portfolio of VBARD is ranked as the highest (63%).

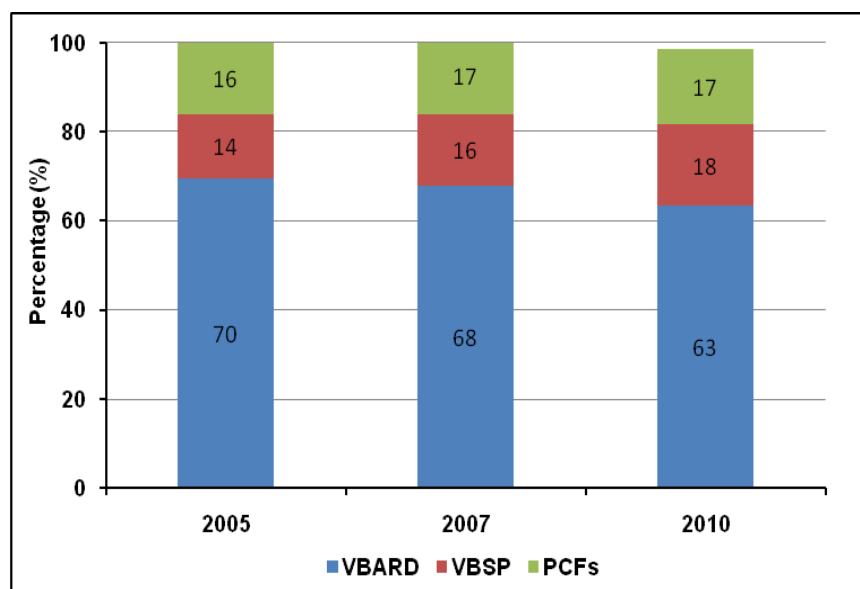


Figure 4.5. Outstanding loans of VBARD, VBSP and PCFs in Hai Duong Province

Source: VBARD in Hai Duong (2011), VBSP in Hai Duong (2011) and PCFs in Hai Duong (2011)

4.2.2. Vietnam Bank for Agriculture and Rural Development in Hai Duong Province

VBARD in Hai Duong is a state-owned commercial bank. It has expanded its branches into every district. The data from Table 4.3 shows that VBARD mainly provided credit to rural areas. In 2010, the share of outstanding loans in rural areas occupied 65% of the total of outstanding loans. With respect to borrowers, the data also shows that most of VBARD's borrowers were rural households (about 94%). Few borrowers were companies. At the provincial level, the data tends to show that VBARD has been remarkably successful in terms of its outreach to rural households.

Table 4.3. Credit supplied by VBARD in Hai Duong Province

Indicator	2005	2007	2010
Total of outstanding loans (bil.VND)	1,895	3,330	5,660
Share of outstanding loans by area (%)	100	100	100
- Rural areas	73	68	65
- Urban areas	27	32	35
Share of outstanding loans by borrowers (%)	100	100	100
- Rural household borrowers	97	96	94
- Company borrowers	3	4	6

Source: VBARD in Hai Duong (2011)

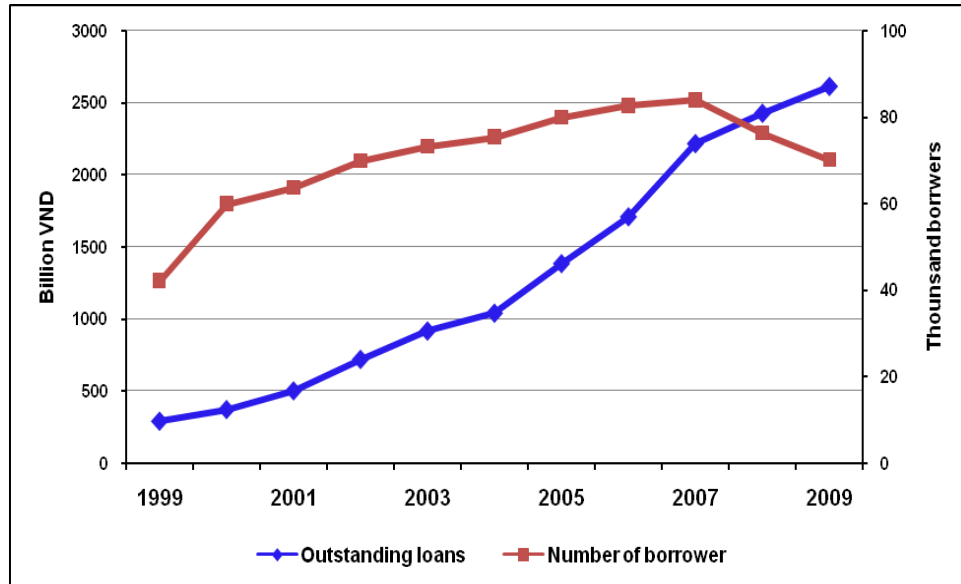


Figure 4.6. Outstanding loans and number of borrowers in the credit program based on Decision No. 67/1999/QD-TTg

Source: VBARD in Hai Duong (2011)

In order to meet the high demand for credit from rural households, in 1999 the government issued Decision No. 67/1999/QD-TTg on the credit policy for the development of agriculture and rural areas. This decision aimed to get VBARD to provide loans under 10 mil.VND to rural households without the requirement of collateral. As illustrated in Figure 4.6, the credit supply provided by VBARD in Hai Duong Province increased considerably in terms of both outstanding loans and the number of borrowers. The outstanding loans of the credit program based on Decision No. 67/1999 QD-TTg was about 290 bil.VND in 1999 and reached 2,621 bil.VND in 2009. In 1999–2009, the number of borrowers also increased from 42,000 to 70,000 borrowers. This result indicates that at the provincial level, VBARD was very successful in providing credit without collateral to rural households. However, a question arises: On the household side, are there any problems of credit access to VBARD by rural households? The answer can only be obtained by an investigation at the rural household level.

4.2.3. Vietnam Bank for Social Polices in Hai Duong Province

The provincial branch of VBSP in Hai Duong Province is a non-profit organization charged with the lending program. The specific lending programs are outlined in Table 4.4. However, as the bank’s name suggests, its primary objective is to contribute to specific policies (predominantly social policies) through the provision of credit.

As shown in Table 4.4, presently VBSP in Hai Duong Province offers seven credit programs under VBSP’s credit program at the national level. The outstanding loans of each lending program have increased annually. The lending program for disadvantaged students has seen a

great increase of outstanding loans, with an annual growth of 126% in 2007–2010. The data also showed that two major programs were credit for poor households and credit for disadvantaged students. By late 2010, outstanding loans amounted to 704 mil.VND for the poor households program and 649 mil.VND for the disadvantaged students program. However, it is unclear how VBSP in Hai Duong Province been so successful in lending to the targeted beneficiaries.

Table 4.4. VBSP’s outstanding loans by credit program in Hai Duong Province

Credit program	Outstanding loans (bil.VND)			Growth rate (%)
	2005	2007	2010	
Production and business of poor households	313	408.7	703.7	17
Education for students	0	56.1	649.5	126
Foreign migrant workers	9	25.2	37.0	33
Promoting job creation	35	45.1	62.5	12
Clean water supply and environment sanitation	33	60.9	154.8	37
Business and production in disadvantaged area	0	5	19.7	58
Housing support	0	0	5.9	-
Total	390	601	1,633	33

Source: VBSP in Hai Duong (2011)

Table 4.5. Outstanding loans of VBSP by branch in Hai Duong Province

Branches	Outstanding loans (bil.VND)			Growth rate (%)
	2005	2007	2010	
City of Hai Duong	27	27	88	27
Chi Linh	32	54	141	35
Kim Thanh	34	54	145	34
Kinh Mon	34	54	159	36
Nam Sach	31	50	141	35
Thanh Ha	34	61	171	38
Cam Giang	33	45	120	30
Binh Giang	31	44	126	33
Gia Loc	31	50	122	32
Tu Ky	36	60	159	34
Thanh Mien	33	46	126	31
Ninh Giang	35	54	135	31
Total	390	601	1,633	33

Source: VBSP in Hai Duong (2011)

Regarding lending at the district level, VBSP in Hai Duong Province has 11 branches at the district level and one branch in the city of Hai Duong. The data from Table 4.5 shows that among branches, the outstanding loan portfolio was different, because of the different population and different poverty rate of each district. The annual growth rate of outstanding loans of each branch was about 30%. The finding is that pursuing the expansion of the credit supply, funded and oriented by the government, each VBSP branch achieved a similar growth rate of outstanding loans.

With respect to the lending network, four mass organizations have been involved in the VBSP’s lending process. As presented in Figure 4.7, the loans supplied by VBSP through the Women’s Union and Farmers’ Union occupied a main share in VBSP’s total outstanding loans. It was due to the fact that most borrowers were members of the Women’s Union and Farmer’s Union.

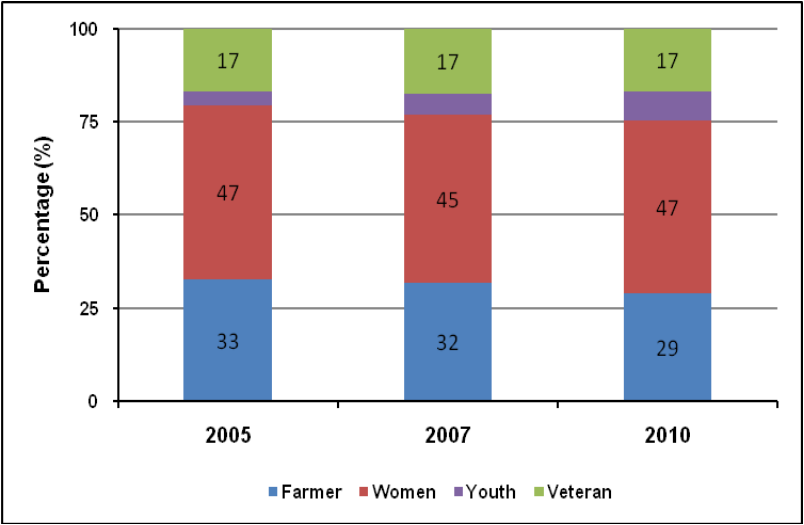


Figure 4.7. Outstanding loans of VBSP lending through mass organizations

Source: VBSP in Hai Duong (2011)

Table 4.6 presents VBSP’s interest rate by each lending program. The interest rates of each program were unchanged in 2005–2010. There were small differences in interest rate among the credit programs.

Table 4.6. Interest rate by credit programs

Unit: Percentage per month

Credit programs	2005	2007	2010
Poor household	0.50	0.65	0.65
Education for students	*	0.57	0.57
International migrant workers	0.50	0.65	0.65
Job creation	0.50	0.65	0.65
Clean water supply and environment sanitation	0.50	0.65	0.90
Business and production in disadvantaged area	*	0.90	0.90
Housing support	*	*	0.25

Source: VBSP in Hai Duong (2011)

* The credit programs did not exist at that time.

The VBSP applied the poverty finance approach to meet the government's social development goal. Many researchers indicate that the credit policy allows low rates of interest and brings benefits to the borrower, which means that there is strong demand for credit. If targeting is inappropriate, the demand will constantly exceed the supply and applicant screening will become more difficult. In extreme cases, people with political influence or those with connections to the authorities can conceivably use this clout to obtain cheap funds.

4.2.4. People's Credit Funds

PCFs are an important formal credit source in the rural areas of Hai Duong Province. At the provincial level, the central People's Credit Funds headquarters is located in the city of Hai Duong. PCFs do not operate at the district level. At the commune level, PCFs are small community-reliant cooperatives owned, operated and governed by shareholder members from the commune in which it is located. The operation of PCFs aims to improve access to financial services for rural people, emphasizing savings and credit discipline. The establishment of a People's Credit Funds office depends on the economic development of the commune. In other words, PCFs did not operate in every commune throughout Hai Duong Province. There were 66 PCF offices in 2005 and 71 offices in 2010. The total of outstanding loans was 440 bil.VND in 2005, reaching 1,639 bil.VND in 2010. PCFs expand in step with the increasing demand for savings and credit in rural areas, especially in connection with workers going abroad on international migrant worker contracts (3 to 4 years) in countries such as Korea, Japan and Malaysia.

4.3. Conclusions

Hai Duong Province, typical of the Red River Delta region, has been in a transition process toward industrialization, leading to decreased agricultural land area and a change in economic structure. The GDP contribution of the agriculture sector to total GDP has decreased. However, rural labor presently occupies a main part in the total population. In addition, the high consumer demand for meat and fish creates a high potential for the development of animal production, which is expected to boost the agricultural sector in the coming years. Animal production can serve as an engine of growth by generating significant farm cash income.

To facilitate rural development and agricultural production, the formal credit sector in Hai Duong Province has been introducing, over the past ten years, several credit programs aiming at the expansion of the credit supply to rural areas for both consumption and production. Despite growth of the credit supply, expansion of animal production will require a higher credit supply from the formal sector to reduce the capital constraint of animal producers.

CHAPTER V : ACCESS TO CREDIT BY ANIMAL PRODUCING HOUSEHOLDS IN HAI DUONG PROVINCE

This chapter aims to analyze the access to credit and identify factors influencing the credit accessibility of animal producing households with regard to some credit sources. This chapter includes seven sections. The first discusses the lending network and lending procedures of the VBSP, VBARD and PCFs as the main formal credit sources on the study sites. In the credit market, access to credit by animal producing households is determined by both the households and the credit suppliers. Regarding the household side, the second section investigates the participation of the surveyed household in the rural credit market. It provides information on the surveyed households, including the animal-based group and the non animal-based group, comparison of loans from various sources, household borrower characteristics and their relationship with amounts borrowed and explanation of credit use. Concerning credit suppliers, the third section examines some problems of access to credit from VBARD and PCFs. Factors affecting the accessibility of households to credit from VBARD and PCFs are investigated in the fourth section. The fifth section discusses social networks and their influence on household credit accessibility. It goes on to discuss the VBARD's requirement of physical collateral. Finally, the sixth section focuses on the strengths and weaknesses of the formal sector in rural lending.

5.1. Lending procedure of formal credit sources in Hai Duong Province

5.1.1. VBSP's lending network and lending procedure

The network of VBSP operates only at the district level. The VBSP has closely cooperated with the local authorities to supply credit to rural households. The VBSP's lending network and lending procedure in Hai Duong Province are outlined in Figure 5.1. VBSP district branches in Hai Duong Province have implemented the lending procedure for rural households. It is quite similar to the guidelines of the VBSP. The VBSP's credit program is designed as a group-based lending scheme. To borrow money from VBSP, a household must join a credit group in its locality. A credit group includes between 5 and 40 members located in the same village. If the number of members in a village is lower than 5, they need to join a group in another village. Each village credit group sets up a management board that is responsible for monitoring the borrowing and credit use of its members. The management board includes the village head and the head of mass organizations (Women's Union, Veterans' Union, and Youth Union).

There are several criteria that a household must meet to become a member of a credit group:

- A long-term residence permit in the locality in which the credit group is established.
- Someone in the household who can work.
- Is classified as poor by the commune authority.

The poverty classification of the rural households is done together with the village head and other mass organization leaders in the village based on the nationally defined poverty line³ and the poverty criteria recognized by the local commune authorities (such as food shortage or living in a damaged house). This classification is done once per year.

Once made a member of a credit group, a household can apply for a VBSP loan. First, it sends a formal letter to their credit group. In the letter, the household specifies the amount and purpose of the loan that it intends to apply for. Then, a meeting is arranged to consider the relevance of the loan. From the survey information, it was found that the participants in the meeting included only members of the management board. The board managers decide which household is able to borrow and how much. A list of applicants is prepared by the village management board and sent to the commune People's Committee. Once the list is ratified by the People's Committee, it will be sent to a VBSP branch for final approval. Obviously, for a rural household to be a borrower of VBSP, much depends on the decision of the village management board and the commune People's Committee. Problems arise related to the decision of the management on borrower selection, and these will be analyzed in more detail later. Regarding the time required to obtain credit, it is not very long. It often takes from one to five weeks to obtain credit from the time the household sends the loan application to its credit group.

³ Vietnam's poverty line is set by the Ministry of Labor, Invalids and Social Affairs with assistance from the World Bank. It is based on the average monthly expenditure per capita. The poverty line has been adjusted several times in recent years, for rural areas as follows: 2002 (149,000 VND); 2004 (170,000 VND); 2006 (200,000 VND); 2008 (290,000 VND) and 2010 (400,000 VND). In rural areas of Vietnam, the poverty rate based on Vietnam's poverty line was 35.6% in 2002, 21.2% in 2004, 18% in 2006, 16% in 2008 and 17.4% in 2010 (GSO, 2010).

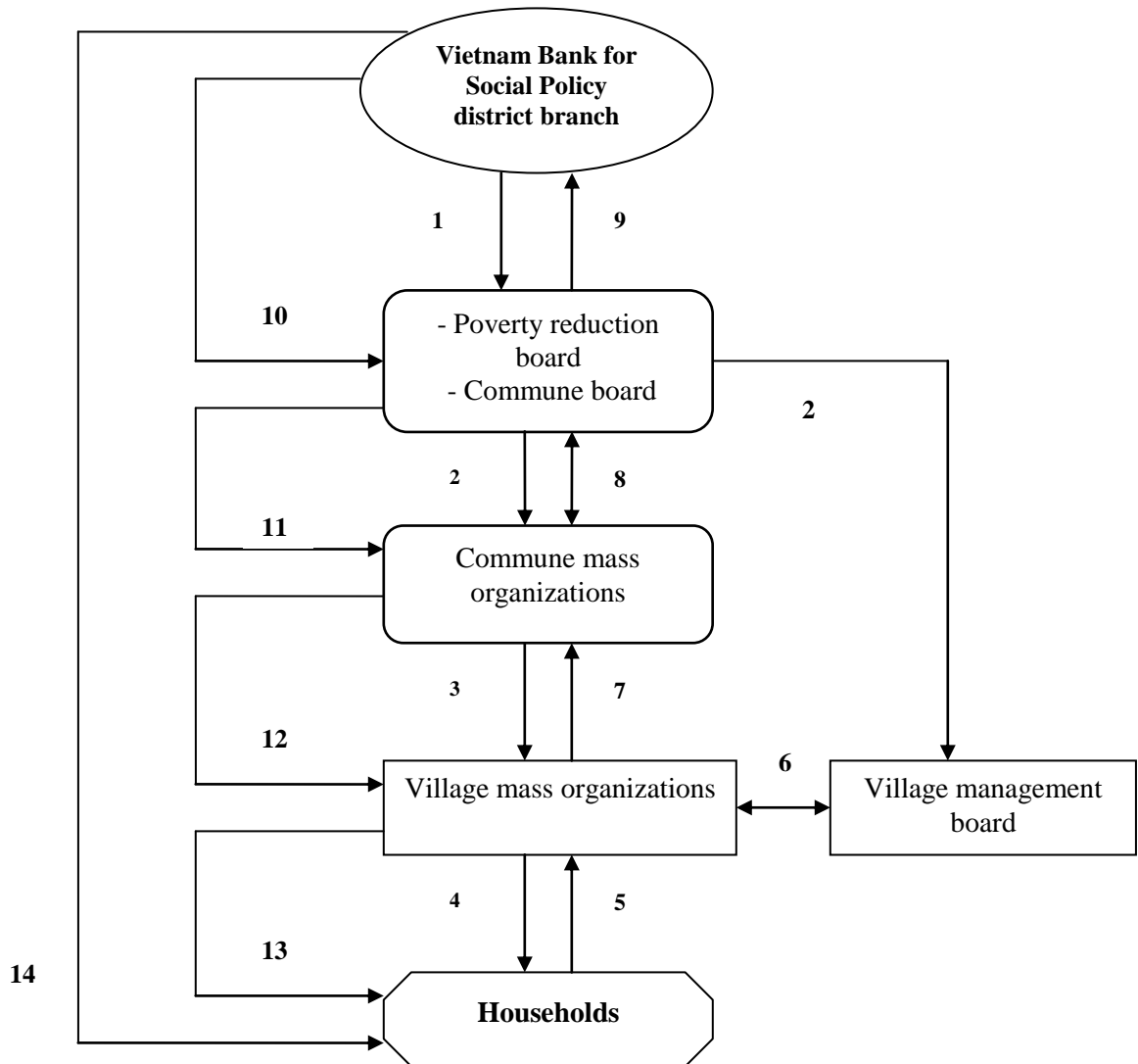


Figure 5.1. VBSP's lending network and lending procedure in Hai Duong Province

Source: Household survey, 2011

Note:

1. Announce loans
2. a. Allocate loans to villages
b. Inform to the village head about loan allocation
3. Assign tasks to mass organizations of village (Farmers' Union, Women's Union, Veterans' Union and Youth Union).
4. Announce loans
5. Apply for loans
6. Coordinate to select borrowers
7. Submit the list of selected borrowers for approval.
8. Coordinate to check the list of selected borrowers
9. Submit the list of selected borrowers
- 10-13. Inform final selected borrowers
14. Disburse loans

5.1.2. VBARD's lending network and lending procedure

Table 5.1. Characteristics of loans and responsibility of various people in commune and village

Amount of loan	Physical collateral	Borrower	One family member (ability to work)	Staff of commune	Staff of mass organizations of commune and village	Head of village
>10 mil.VND	Required	<ul style="list-style-type: none"> ✓ Contact the head of village, staff of commune, staff of VBARD ✓ Complete and submit a loan application form 	Give signature as "trust mortgage" for household borrower's loan payment	Give signature and the head of commune's official stamp for proving of legal physical collateral	Provide information on credit	Provide information on credit
<= 10 mil.VND	<ul style="list-style-type: none"> ✓ No (according to the guideline of lending policy) ✓ Yes (in reality) 	<ul style="list-style-type: none"> ✓ Contact staff of mass organization, staff of VBARD ✓ Complete and submit a loan application form 	Give signature as "trust mortgage" for household borrower's loan payment		<ul style="list-style-type: none"> ✓ Provide information on credit ✓ Give signature as "trust mortgage" for household borrower's loan payment 	Provide information on credit

Source: Household survey, 2011

The VBARD also has branches at the district level. It was found that two lending procedures have been practiced in Hai Duong Province. Generally, VBARD provides credit where there is physical collateral. In particular, under Decision No. 67/1999/QD-TTg (credit policy for agriculture and rural development dated May 30, 1999), farmers are permitted to borrow less than 10 mil.VND without physical collateral. However, mass organizations must sign as "trust mortgage" for a borrower. In other words, farmers must submit their loan application form to mass organizations to get its signature before the loan application is submitted to the VBARD. As detected from field work on the study sites, there are two procedures for lending with physical collateral. For the first, the farmers directly contact VBARD's staff at the district level, by passing the village head and staff of mass organizations. For the second, the farmer contacts the village head before working with VBARD's staff at the district level.

The first lending procedure consists of the following steps:

- i. The farmer goes to VBARD's branch in the district to discuss with the bank the purpose of the loan, its amount and term. Then, the farmer receives the application form.
- ii. The farmer fills in the form at home, because his or her spouse and any children over 18 years old in the household have to co-sign it.
- iii. The farmer takes the form to the commune to get a signature and a stamp from the commune chief.
- iv. The farmer takes the form and land use certificate to the bank. (The credit officer visits the household to check if everything is correct and arranges an appointment at the bank. He mainly checks the collateral.)
- v. The farmer has to return to the bank to ask whether his application has been approved or not. If so, a date is set with the credit officer for disbursement of the money.
- vi. The farmer comes on the arranged date and receives the loan disbursement.

The second lending procedure also includes seven steps. However, the two first steps differ from those of the first procedure.

- i. The farmer asks for information on credit availability through the village head and proposes the head of village inform their demand on borrowing money to the staff of VBARD.
- ii. After receiving the information from the village head by telephone, the staff of the bank comes to farm household to take a look at the housing, production and business status of the farm household in the light of the credit request and gives the credit application form to the farmer. In most cases, only a few farmers want to borrow money at the same time. Consequently, they normally have to wait for some weeks for a visit from the bank's staff.
- iii. The five remaining steps are as the same as Steps 2 to 6 of the first procedure. On the study site, it was found that a farmer who is unable to supply all the credit information required by VBARD usually selects the second lending process to facilitate the borrowing procedure. The second lending process has both advantages and disadvantages for farmers. More details will be provided later.

5.1.3. Lending procedure in PCFs

The PCFs system is designed as a member-owned organization, which aims at mobilizing savings from its members. It has to be managed according to the economic principle of cost-covering. It is not designed to receive subsidies from the government. Its credit funds fall under the stipulation of the Cooperative Law of 1997. As financial institutions, they have to follow the regulations as required by the Banking Law of 1998. The lending procedure of PCFs is as the same as the first lending procedure of VBARD. PCF offices are located in the commune. This makes it more convenient for farmers to apply for a loan. It takes less time to complete the lending procedure of PCFs than those of VBARD.

5.2. Participation of animal producing households in the rural credit market

5.2.1. Information on animal producing households surveyed

As mentioned earlier, the surveyed households engage in integrated animal production, including poultry, pigs and fish. Their production scale also differs. The ratio of annual income from animal production to total income was selected as a criterion to classify the surveyed households into two groups, namely animal-based group and the non animal-based group. The purpose is to explore differences in credit accessibility between the two group types.

Information on the surveyed households is given in Table 5.2. The animal-based group included 58 households (40%) and the 87 remaining (60%) belonged to the non animal-based group. Regarding human capital, there were not many differences between two groups. Hai Duong Province is characterized by the socioeconomic features of the Red River Delta region where it is located. Farmers there have relatively easier access to education than those in other regions characterized by poor roads, inadequate electricity and bad weather conditions. Hai Duong's farmers have a slightly higher education level than those in other regions of Vietnam. However, household heads in the animal-based group had a slightly higher education level than those in the non animal-based group. The level of education partly affects their access to information on socioeconomic aspects (such as market information, technical know-how and social relationships). Farmers with a low level of education typically had less access to information than those with a high level of education.

The family size and dependents ratio of rural households are lower than other regions (mountainous and remote regions). In Hai Duong Province, each rural household normally had 4 to 6 members, including 2 to 3 children. It positively reflects the family planning program of the Vietnamese government aimed at reducing population growth.

In terms of arable land, both groups had similar landholdings. Unlike the Mekong Delta region and the central region of Vietnam, in Hai Duong Province, the area of arable land owned by farmers was relatively smaller than in the other regions due to the high population density. With limited land for cultivation, expansion and improvement of animal production could partly contribute to increase farmer household incomes. The animal-based group had a relatively large area of fish pond and possessed a higher value of assets than the non animal-based group.

Table 5.2. Information on animal producing households by group

Indicators	Unit	Animal-based group n=58		Non animal-based group n=87		P values
		Mean	S.D.	Mean	S.D.	
Age of household head	Years of age	45	7.5	46	9.3	0.79
Education of household head	Years of schooling	7.5	1.3	7.0	1.1	0.55
Family size	Persons	4.6	1.0	4.5	0.9	0.56
Number of workers	Persons	2.4	0.8	2.5	0.8	0.83
Dependency ratio		0.4	0.1	0.5	0.2	0.71
Area of cropland	1,000 m ²	2.2	0.9	2.6	1.1	0.06*
Area of fish pond	1,000 m ²	3.5	2.4	1.4	1.2	0.00***
Total value of assets	Mil.VND	127	84	85	62	0.00***
Number of household owning fish ponds	Household	57		27		-

Source: Household survey, 2011.

Note: *** and * significant levels at 1% and 10%, respectively.

5.2.2. Participation of animal producing households in the rural credit market

As detected from the survey, there was a high demand for credit from farm households in both groups. The animal-based group needed credit to buy feed, breeding stock, payoff older loans and upgrade fish ponds. The farm households in the non animal-based group did not find stable non-farm jobs. Therefore, they desired to borrow money for animal production. The farmers borrowed money from the formal sector or the informal sector. It was also possible for them to borrow from both sources at the same time. The farmers tried to borrow money from the formal sector since its interest rate was significantly lower than the informal sector.

As shown on Table 5.3, the formal sector became the main credit supplier for the animal producing households. Of the borrowers, 63% received loans from the formal sector, whereas 37% had loans from the informal sector. Within the formal sector, the number of loans from VBARD (48%) was the highest proportion, followed by VBSP (35%) and PCFs (17%). Regarding borrowers of each household group, 77% of borrowers in the animal-based group obtained credit from the formal sector, while this figure in the non animal-based group was 52%. In addition, 23% of borrowers in the animal-based group were supplied credit by the formal sector compared to 48% from the non animal-based group. The non animal-based group depended more on the informal credit than the animal-based group. This implies that the credit provided by the formal sector did not fulfill all the credit needs of farmer households.

Regarding loans supplied by the formal sector, 60% of loans in the animal-based group were from VBARD, while only 33% of loans in the non animal-based group were from that source. The tendency of loan supply was also similar for PCFs. The animal based group also had a higher proportion of loans supplied by PCFS than the non animal-based group. In contrast, 21% of loans in the animal-based group were provided by VBSP while 52% in the non animal-based group were supplied by VBSP. As detected from the field survey, many

borrowers in the non animal-based group came under the category of the poor, targeted clients of VBSP, so they borrowed money more easily from this source.

Two main reasons for the higher proportion of loans from VBARD and PCFs for the animal-based group: (i) VBARD and PCFs are commercial banks. The lending interest rates of both banks are determined at the same level as that of the other commercial banks but are higher than those of VBSP. The animal-based groups need loans for animal production. Therefore they accepted the interest rates on loans from VBARD and PCFs; (ii) physical collateral is required from a borrower. However, the non-animal-based group, including many of its poorest members, often lacks physical collateral. As a result, they had less access to credit from VBARD and PCFs. The higher proportion of loans from VBSP of the non animal-based group can be explained in that the non animal-based group includes many poor, who are targeted clients of VBSP.

On the other hand, it must also be borne in mind that VBSP targets supplying credit to the poor. The staff members of mass organizations in the commune and the village head have the responsibility to select the borrowers. Importantly, it was found that the non-poor also obtained credit from VBSP. Firstly, the staff members of mass organizations and the village head were concerned about non-performing loans. Secondly, the staff of mass organizations and the village heads gave priority to their own families, relatives and friends because of their close relationships.

Table 5.3. Financing sources of animal producing households

	Total		Animal based-group		Non animal-based group	
	Fre.	%	Fre.	%	Fre.	%
Borrowers by sector	129	100	57	100	72	100
Formal sector	81	63	44	77	37	52
Informal sector	48	37	13	23	35	48
Borrowers receiving loans from both sectors	25	100	11	100	14	100
Households without loan	41	100	12	100	29	100
Number of loans						
Formal sector	93	100	53	100	40	100
- VBARD	45	48	32	60	13	33
- VBSP	32	35	11	21	21	52
- PCFs	16	17	10	19	6	15
Informal sector	49	100	13	100	36	100
- Friends and relatives	33	67	7	54	26	72
- Village moneylender	16	33	6	46	10	28

Source: Household survey, 2011.

Note: The total number of those borrowing from the formal sector is lower than the total number of loans from all sources (VBARD, VBSP and PCFs) because a household can borrow money from more than one lender during the same year. It is similar for the total number borrowing from the informal sector.

Concerning households who were without loans, 41 surveyed households did not get any credit in the year 2010 even though they had credit needs. Some farmers indicated that their families were ranked as non-poor households within the village. Thus, they were excluded as

potential VBSP beneficiaries. Others reported that they did not get a loan from VBSP due to limited capital for lending. The remaining farmers did not borrow money either from VBARD or PCFs for various reasons that are mentioned later.

Table 5.4. Average loan amount by credit source

Unit: mil.VND per household borrower

Sources	Total		Animal-based group		Non animal-based group		P values
	Mean	S.D.	Mean	S.D.	Mean	S.D.	
Formal sector							
-VBARD	28.2	11.3	31.9	9.8	18.8	9.7	0.00***
-VBSP	8.4	2.6	8.5	2.8	8.3	2.3	0.70
-PCFs	25.3	6.5	25.5	5.9	24.5	8.0	0.90
Informal sector							
-Friends and relatives	5.6	4.5	10.2	6.0	4.3	3.0	0.04***
-Village moneylender	10.0	6.3	14.6	4.5	7.3	5.0	0.04*

Source: Household survey, 2011

Note: *** and * significant levels at 1% and 10%, respectively.

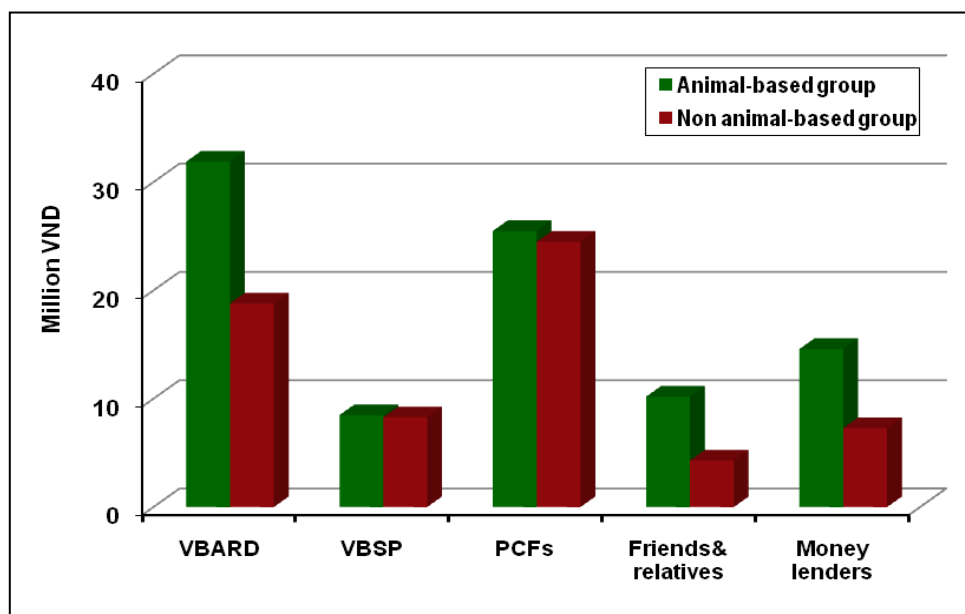


Figure 5.2. Average loan amount by credit source

Source: Household survey, 2011

Countrywide, VBARD is the largest credit provider in the rural areas of Vietnam. In Hai Duong Province, VBARD is the main credit supplier. In terms of loan amounts, farmers borrowed the highest amount from VBARD and the second highest amount from PCFs. VBSP had the smallest loan. The amount of loans from the informal sector was relatively lower than from the formal sector.

The average loan amount from all credit sources of the animal-based group was relatively higher than that of the non animal-based group. For example, VBARD's loan portfolio was 31.9 mil.VND for the animal-based group and 18.8 mil.VND for the non animal-based group. Concerning the number of borrowers from the informal sector, 23% of borrowers in the animal-based group received loans from the informal sector, while 48% of borrowers in the non animal-based group obtained loans from this source (Table 5.3). However, the informal loan amount of the animal-based was higher than that of the non animal-based group. This implies that the animal-based group had better credit access from both sectors in terms of loan size than the non animal-based group.

As mentioned, compared to the non-animal based group, the animal based-group had the higher proportion of households who received loans from the formal sector. The animal-based group borrowed larger loans compared to those of the non animal-based group. This partly reflects a higher demand for credit and better credit access of the animal-based group compared to the other group as both groups need credit to finance their production and consumption.

Table 5.5. Interest rate and maximum loan terms by credit source

Sources	Ranges of interest rate (% per month)		Maximum loan terms (months)
	Minimum	Maximum	
Formal sector			
-VBARD	1.16	1.30	24
-VBSP	0.50	0.80	24 ¹
-PCFs	1.25	1.50	12
Informal sector			
-Friends and relatives	0	0	2
-Village moneylender	3.00	5.00	3

Source: Household survey, 2011

Note: ¹Maximum of loan term depends on the credit program. The credit program for education provided loans which could have a term up to 60 months.

As for interest rates, in the year 2010, monthly interest rates on loans provided by VBARD and PCFs varied slightly. The change in interest rates of both banks was affected by the interest rate adjustment defined by the State of Bank of Vietnam. Generally, the interest rate of loans supplied by VBSP has not changed in recent years. However, it was different among credit programs and ranged from 0.5 % to 0.8%. Village moneylenders charged the highest interest rate compared to the other sources. It ranged from 3.0 % to 5.0%. With respect to loan term, it varied from one source to another. Referring to VBSP, the maximum loan term

depended on the credit program. The credit program for education provided loans which could be up to 60 months.

Table 5.6. Distribution of loan amount by source

Unit: Percentage

Ranges (mil. VND)	VBARD	VBSP	PCFs	Relatives and friends	Money- lenders
Up to 10	11	94	6	85	63
11-20	20	6	38	15	37
21-30	45	0	50	0	0
>31-50	24	0	6	0	0
Total	100	100	100	100	100

Source: Household survey, 2011

The loan amount was classified into different groups for detailed analysis of the loan amount supplied by formal sources. As shown in Table 5.6, the number of small loans supplied by VBSP was higher compared to those of the other two formal credit sources. The number of loans given by VBSP was 32, of which 94% ranged from 5-10 mil.VND. A few loans were more than 10 mil.VND. It can be explained that VBSP supplied credit with a subsidized interest rate and its lending capital mainly depends on the government's provision. Therefore, the loan size given by VBSP was limited. In addition, this also implies that credit for the poverty alleviation program was allocated uniformly without considering the difference in credit needs of each household.

Of the total number of loans provided by VBARD, loans from 20 to 30 mil.VND occupied the highest share (45%) while loans from 31 to 50 mil.VND accounted for 24%. For PCFs, loans from 11 to 30 mil.VND occupied the main share of the total number of loans. Of surveyed households, not one obtained a loan amount of over 50 mil.VND from PCFs. The finding here is that the amount of loans supplied by VBARD and PCFs was much larger compared with that of VBSP. This implies that VBARD and PCFs likely provide credit based on the difference in credit need of farmer households more than VBSP does. Furthermore, VBARD and PCFs supplied credit based on physical collateral. Consequently, those larger loan amounts were higher than VBSP.

As illustrated in Table 5.6, the number of loans provided by friends and relatives was relatively higher compared to that from village moneylenders. Most of the loans from friends and relatives were less than 10 mil.VND. Some loans ranged from 11 mil.VND to 20 mil.VND. The surveyed households indicated that it was impossible for them to get loans easily from friends and relatives whenever they wanted to borrow money. Loans from friends and relatives were typically for a very short-term and for cases of emergency (such as illness or accident). Friends and relatives also need money for production and daily expenditures. In many cases, loans from friends and relatives were not available for this. The final choice for farm households was to try borrowing from village moneylenders. Loans from village moneylenders were more diversified in terms of loan amount than loans from friends and relatives. However, most of the loans ranged from 5 mil.VND to 10 mil.VND.

Table 5.7. Number of borrowers by group and by loan amount from formal sector

		Ranges (mil.VND)				Total
		Up to 10	11-20	21-30	31-50	
Animal-based group	Num. of borrowers	2	8	19	15	44
	Percentage (%)	5	18	43	34	100
Non animal-based group	Num. of borrowers	18	10	8	1	37
	Percentage (%)	48	27	22	3	100
Total	Num. of borrowers	20	18	27	16	81
	Percentage (%)	25	22	33	20	100

Source: Household survey, 2011

Note: Result of Chi-Square tests: Chi-square calculation = 29.3 > Chi-square table = 5.9 at 5%.

It can be observed from Table 5.7 that the number of borrowers with a large loan in the animal-based group was significantly higher than that in the non animal-based group. And 34% of borrowers in the animal-based group got a loan ranging from 31 mil.VND to 50 mil.VND while 3% of borrowers in the non animal-based group took out loans of the same amount. Given about half of the number of borrowers in each group, the high variation in loan amount existed between two groups. Thus, 43% of borrowers in the animal-based group took out loans varying from 21 mil.VND to 30 mil.VND and 48% of borrowers in the animal-based group took out loans of less than 10 mil.VND. Using the Chi-square test, it was identified that Chi-square calculation was higher than Chi-square table at 5%. This concretely shows that the percentage in the animal-based group took out large loan amounts from the formal sector, higher than that in the non animal-based group.

Table 5.8. Number of borrowers by group and by range of loan amount from informal sector

		Range (mil.VND)		Total
		Up to 10	11-25	
Animal-based group	Num. of borrowers	6	7	13
	Percentage (%)	46	54	100
Non animal-based group	Num. of borrowers	32	3	35
	Percentage (%)	92	8	100
Total	Num. of borrowers	38	10	48
	Percentage (%)	79	21	100

Source: Household survey, 2011

Note: Result of Chi-square tests: Chi-square calculation = 11.7 > Chi-square table = 3.8 at 5%.

As illustrated in Table 5.8, the percentage of borrowers in the non animal-based group borrowing less than 10 mil.VND from the informal sector was very high (92%). Some households in the non animal-based group borrowed more than 10 mil.VND from the same source. More than half of borrowers in the animal-based group borrowed more than 10 mil.VND from the informal sector. It was detected that the animal-based group borrowed money from the informal sector to repay old loans from the formal sector when their animals were in the reproduction cycle and cannot be sold. The Chi-square test result showed that Chi-square calculation is higher than Chi-square table at 5%. It concretely indicated that the percentage of borrowers in the animal-based group taking out large loan amounts from the informal sector was higher than that in the non animal-based group.

5.2.3. Characteristics of household borrowers and relationship to amounts borrowed

In credit transactions, many factors simultaneously determine the terms of contracts such as amount, interest rate, purpose, collateral requirement and repayment schedule. These are determined by agreement between borrower and lender in the rural market. The loan amount received from a credit source is based on both credit demand and credit supply. For example, an increase in farm size will raise the absolute amount of credit, as it affects the total demand for credit. It will also affect the interest rate, as it increases the collateral value of borrowing, thereby increasing the supply of credit. The implication is that the supply and demand curves of credit cannot be separately identified, unless the determinants of credit supply and demand, other than borrower-specific variables, are used for the estimation (Duong and Izumida 2002). Based on the range of amount borrowed, borrowers were classified into several groups to compare some differences in borrower characteristics and their relations with amounts borrowed from the formal sector and informal sector, respectively.

As shown in Table 5.9, there were differences in some household characteristics among groups. However, some of them were statistically significant differences. Household heads with a high level of education, which created better production skills, tend to borrow higher amounts of money. In terms of statistically significant comparison, the education level of household heads did not show differences among borrower household groups.

In addition, there were small differences in family size and number of laborers among household groups. Noticeably, the dependency ratios were significantly different. Households having higher dependency ratios borrowed lower amounts of money from formal sources than households with lower dependency ratios. It can be explained that they usually need credit for urgent consumption needs, while in the rural areas of Vietnam the formal sector mainly provides credit for production. Households owning large fish ponds, large flocks of poultry and pig herds had a higher demand for credit for purchasing of production inputs. They prefer to borrow money from formal credit sources because lending interest rates were significantly lower than those of village moneylenders. It was found that farmers did not use their loans from formal sources for crop production. Instead, they used their own money to invest in crop production, resulting in a shortage of money for animal production. Hence, households with large areas of cropland seemingly borrowed larger amounts of money from the formal sector.

Table 5.9. Characteristics of household borrowers from the formal sector
(Grouped by loan amount)

Indicators	Unit	Ranges (mil. VND)				P values
		Up to 10	11-20	21-30	31-50	
		n=20	n=18	n=27	n=16	
		Mean (S.D)	Mean (S.D)	Mean (S.D)	Mean (S.D)	
Age of household head	Years of age	48.2 (7.6)	46.8 (9.1)	48.5 (6.6)	45.0 (7.1)	0.47
Education of household head	Years of schooling	6.8 (1.1)	7.3 (1.2)	7.2 (1.1)	7.5 (1.2)	0.19
Family size	Persons	4.7 (0.9)	4.5 (0.6)	4.8 (1.3)	4.3 (0.6)	0.52
Number of laborers	Persons	2.3 (1.0)	2.5 (0.7)	2.6 (1.0)	2.4 (1.6)	0.70
Dependency ratio		0.53 ^a (0.2)	0.45 ^b (0.1)	0.41 ^b (0.2)	0.43 ^b (0.1)	0.07 ^{**}
Area of crop land	1,000 m ²	2.1 ^a (0.6)	3.0 ^b (1.2)	2.3 ^a (1.3)	2.8 ^b (1.1)	0.08 ^{***}
Area of fish pond	1,000 m ²	1.2 ^a (0.8)	3.1 ^{ab} (1.9)	3.5 ^{ab} (2.9)	4.2 ^b (2.3)	0.08 [*]
Size of poultry flock	Birds per year	185 (60)	198 (95)	200 (101)	242 (18)	0.14
Size of pig head	Head per year	10 ^a (7.8)	15 ^{ab} (12)	17 ^{ab} (9.6)	25 ^b (14)	0.01 ^{***}

Source: Household survey, 2011.

Note: In order to obtain a good statistical result of mean comparison, borrowers were not separated into the animal-based group and the non animal-based group due to the small number of borrowers; ^{***}, ^{**}, and ^{*} significant levels at 1%, 5% and 10%, respectively; ^{ab} means in the same row without common letter are different at P < 5% by Ducan test.

Looking at the demand side, the statistical comparison showed that some household characteristics, including dependency ratio, area of crop land, area of fish pond, and number of pigs, showed statistically significant differences among borrower groups and had a positive trend in relation with the amounts borrowed from the formal sector.

With respect to the relation between household characteristics and informal borrowing amounts, Table 10 presents the different household characteristics between the two groups, which differed in amounts borrowed.

It was likely that older household heads had better social relationships with their relatives and village moneylenders. As a result, they borrowed larger amounts of money from the informal sector than younger household heads. The education level of the household head had a negative trend in relation with the amount borrowed from the informal sector because many farmers already obtained credit from the formal sector. In addition, households with a large family size, high number of workers, high number of dependents, large area of fish pond, large poultry flock and pig herd size borrowed higher amounts from the informal sector because they need credit not only for animal production but also for their consumption (e.g. tuition fees, medical fees, funeral expenditures and repayment of old loans). The informal sector can

lend for such purposes due to the flexibility and monitoring advantage of this sector. It is important to note that households that obtained large loan amounts from the formal sector also borrowed large amounts of money from the informal sector. This phenomenon existed because some households borrowed money from village moneylenders to repay old debts to the formal sector suppliers at due date.

As illustrated in Table 10, P values show that with regard to area of fish pond, number of pigs, number of poultry and loan amount from the formal sector, there were statistically significant differences between the two groups. This implies that on the borrower's side, there were dominant household characteristics having a positive trend in relation to amounts borrowed from the informal sector.

Table 5.10. Characteristics of household borrowers from the informal sector
(Grouped by ranges of loan amount)

Indicators	Unit	Ranges (mil. VND)				P values
		Up to 10 n=38		11-25 n=10		
		Mean	S.D.	Mean	S.D.	
Age of household head	Years of age	46.0	9.6	47.0	6.5	0.93
Education of household head	Years of schooling	7.1	1.0	6.9	1.2	0.69
Family size	Persons	4.5	0.8	4.9	0.8	0.21
Number of laborers	Persons	2.4	0.8	2.6	0.9	0.61
Number of dependents	Persons	2.0	0.6	2.2	0.4	0.33
Dependency ratio		0.46	0.1	0.45	0.1	0.96
Area of cropland	1,000 m ²	2.3	0.9	2.0	0.7	0.50
Area of fish pond	1,000 m ²	2.2	1.4	5.3	4.5	0.09*
Loan amount from the formal sector	Mil.VND	15.1	10.3	25	10.8	0.03**
Size of poultry flock	Birds per year	173	58	226	89	0.00***
Size of pig herd	Head per year	10.6	7.3	23.9	15.5	0.04**

Source: Household survey, 2011

Note: ***, **, * significant levels at 1%, 5% and 10%, respectively.

According to Duong and Izumida (2002), the dependency ratio and farmland area are likely to be the main factors that determine the amount borrowed by households from the informal sector. This implies that farm households with many dependents (mainly the poor) take out credit from the informal sector to cover consumption expenses at critical times. In addition, total farmland area positively correlates with the loan amount borrowed from the informal sector. Because some farm households would have difficulty getting loans from the formal sector, they borrow from the informal sector even at high interest rates to finance their production.

In summary, it can be concluded that the relationship between some household characteristics and the amount borrowed from the informal sector is important in Vietnam's rural areas as well as in Hai Duong's rural areas due to the strong credit demand of farmers.

5.2.4. Credit use by animal producing households

The way the surveyed households used credit is shown in Table 5.11. Generally, credit was used for production, business and other activities. For production and business, credit was used to purchase breeding animals and feed, upgrade a livestock shelter and/or fish pond, purchase farming equipment and run a small business. For other activities, credit was used to pay school fees, medical fees, house repairs and special events (e.g. wedding or funeral) and pay off old debts. It was found that credit from VBARD and PCFs were entirely used for the purchase of animal stock and feed. Many surveyed borrowers indicated that given the limited amount of their loan, purchase of animals and feed were more important than upgrading an animal shelter. They only used their loan to upgrade a livestock shelter or fish pond if it was in very bad condition.

Table 5.11. Credit use by animal producing households

Unit: Percentage

Loan use	Formal sources			Informal sources	
	VBARD	PCFs	VBSP	Relatives	Money-lenders
Production and business					
Purchase of breeding animals	24	21	8	0	0
Purchase of feeds	76	76	6	0	0
Upgrading of animal shelter	0	3	0	4	0
Purchase of farming equipment	0	0	0	3	0
Operating a small business	0	0	0	9	0
Other activities					
School fees	0	0	75	8	0
Medical fees	0	0	0	24	35
House repairs	0	0	6	21	0
Wedding or funeral	0	0	0	19	25
Repayment of old debts	0	0	5	12	40
Total	100	100	100	100	100

Source: Household survey, 2011

A high proportion of loans from VBSP were spent by farmers to pay the school fees of their children. Obviously, the credit program for education helped the poor to send their children to a vocational school, college or university. Most of the surveyed households are agriculture based and often lack cash. They cannot get credit from formal credit suppliers in short order for their urgent needs. Therefore, credit from informal suppliers was mainly used for urgent farmer household needs. Loans from informal sources were mainly used for household consumption, especially in cases of emergency (illness, funerals, etc.). Spending on medical fees, a wedding or funeral occupied a high share in the total amount of loans provided by informal lenders. Thus, informal lenders in the rural area play a crucial role in helping to meet

the urgent consumption needs of farmer households. However, credit from informal suppliers served for farmers in the very short term.

Importantly, it was realized that 43.8% of loans from village moneylenders were used to repay old debts. Many surveyed households indicated that in many cases, they must borrow money from moneylenders at high interest rates to pay back old VBARD and PCFs loans as the repayment date approaches.

Duong and Izumida (2002) found that 54% of the formally sourced loans were used for livestock, followed by 28% for crop growing. This accurately reflects that investment in livestock has become a trend in Vietnamese farmer households in recent years.

5.3. Problems of access to credit from VBARD and PCFs

In Vietnam, the income level of households for a specific region, defined by the Ministry of Labor, Invalids and Social Affairs, is used as the criterion to classify household groups. The poverty line is set to define the poor. Practically, at the commune level, the classification of poor households does not exactly follow the poverty line because it also depends on the specific situation of each commune. Poverty criteria are also set up by local commune authorities (such as lack of food or living in a damaged house, low income and number of dependents) and may be very different from one commune to another.

Of the total surveyed households, poor households accounted for about one third. Loans from VBSP with subsidized interest rates targeted the poor. VBSP's capital for lending is limited. Most of the non-poor realized that they were excluded from VBSP's beneficiaries. Consequently, they did not apply to borrow money from this source. On the other hand, the lending method of VBSP differs from that of VBARD and PCFs. The group lending method is applied by VBSP while the loan provision with the requirement of physical collateral is mainly used by VBARD and is applied in all cases by PCFs. For these reasons, the following sections only focus on analysis of the behavior of VBARD and PCFs in their capacity as commercial banks responding to the credit demands of farmer households.

Table 5.12. Credit access by animal producing households to VBARD and PCFs

	Total		Animal-based group		Non animal-based group	
	Num.	Per. (%)	Num.	Per. (%)	Num.	Per. (%)
Household with credit need	145	100	58	100	87	100
Household not applying credit	69	48	11	19	58	67
Credit-applied household	76	52	47	81	29	33
Loan application approved	61	42	42	73	19	22
- <i>Loan amount granted in full</i>	41	14	26	45	15	17
- <i>Loan amount granted in part</i>	20	28	16	28	4	4
Loan application refused	15	10	5	8	10	11

Source: Household survey, 2011

Both VBARD and PCFs are formal lenders and provide credit requiring physical collateral. In order to obtain credit from banks, households have to submit their loan application form to the banks. As shown on Table 5.12, of the surveyed households, 76 households (52%) applied for credit to VBARD or PCFs whereas the 69 remaining households (48%) needed credit, but did not apply for it. In addition, 42% of households were provided loans whereas 10% of households were refused. And 14% of households received their requested loan amount in full, while 28% of households obtained part of the required loan amount. This implies that many surveyed households lacked access to credit from VBARD and PCFs. In other words, they are faced with credit access constraints. It is pertinent to investigate what caused this situation.

Within each group, 73% of households in the animal-based group were provided a loan. This figure was substantially higher than the 21% of households in the non-animal based group. It is necessary to note that the proportion of households that were refused to provide loans, were 8% for the animal-based group and 12% for the non-animal-based group. For those whose loans were refused, the bank staff responded that it was due to the unavailability of lending capital at the time they applied. The farmers also stated that in the last four months of the year, they were in need of credit to invest in animal production. However, it was more difficult to obtain a loan from banks. This reveals that credit supplied to the agriculture sector by both commercial banks did not meet the time requirement of farmers.

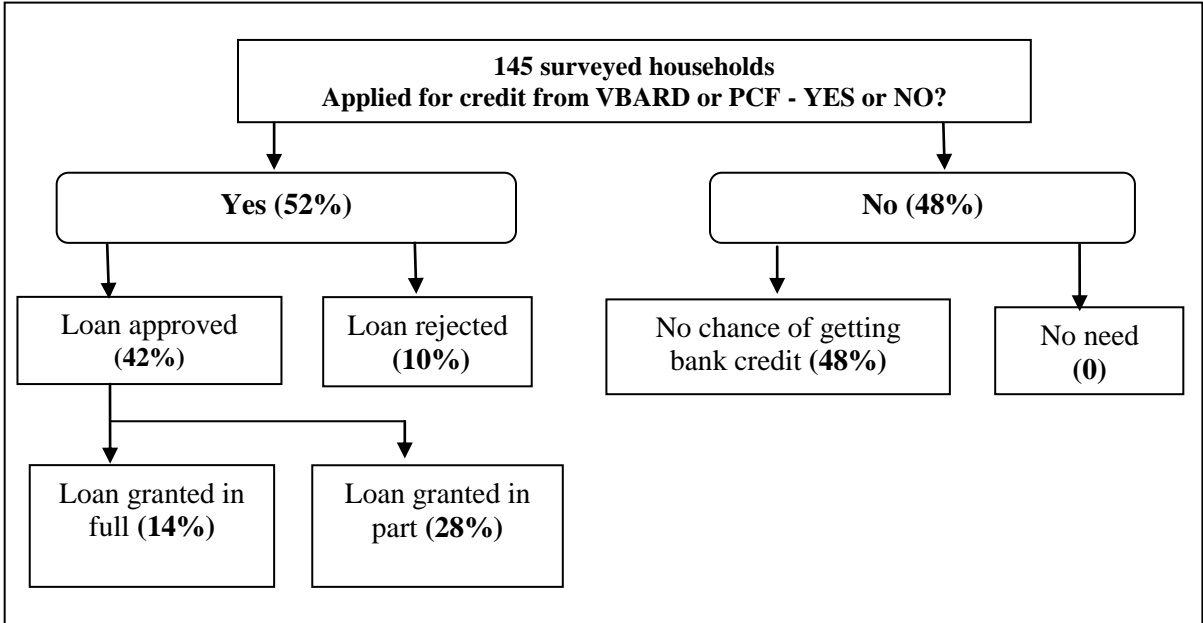


Figure 5.3. Access to credit by animal producing households from VBARD and PCFs

Source: Household survey, 2011

Concerning reasons for not applying for credit, 41% of households not submitting the credit application form to VBARD or PCFs reported that they actually needed credit for their production, but were afraid of being refused by both VBARD and PCFs. Most of these households had never borrowed money from VBARD, so they did not understand the lending procedure of VBARD. Also, they had never directly contacted the VBARD and PCFs (Table 5.13).

Table 5.13. Reasons for animal producing households not applying for credit from VBARD and PCFs

	Frequency	Percentage (%)
Household not applying for credit	69	100
Not needing credit	0	0
Needing credit but did not apply	69	100
- Afraid of risk	20	29
- Afraid of refusal	28	41
- Lack of physical collateral	16	23
- Loan interest rate too high	5	7

Source: Household survey, 2011

Furthermore, 23% of households had no physical collateral. Consequently, they neither applied for credit from PCFs nor VBARD. It is impossible for them to get loans from PCFs if they lack collateral. For VBARD, the government states that farm households can receive loans of less than 10 mil.VND without collateral. However, in reality, many surveyed households were unable to borrow less than 10 mil.VND since they lacked collateral. It was found that this situation was mainly caused by a lack of relevant credit information from VBARD. This is also due to the fact that VBARD in Hai Duong Province has a tendency to avoid lending small amounts without collateral to farmers because of high transaction costs and risks.

This finding relating to physical collateral and its effect on credit access is supported by McCarty (2001), Marsh et al. (2004) and BPN (2008). They also found that VBARD still required the certificate of land use rights plus the guarantee from local authorities as loan security. Therefore, households without certificates had difficulty accessing formal loans from VBARD.

In addition, 29% of households did not apply for credit because they encountered high input and low output prices, disease epidemics, etc., causing uncertainty. They actually wanted to borrow money for their input investment in animal production, but were afraid of being unable to repay loans. And 7% of households complained that the interest rate was too high, leading to a low profit from animal production.

In summary, it was found that despite having a need for credit, many surveyed households did not apply for credit from VBARD and PCFs due to constraints such as an information shortfall on the credit program, being refused, afraid of being unable to repay a loan, lack of physical collateral and the high interest rates of VBARD and PCFs.

Cam Hoang commune in Cam Giang district is about 70 kilometers from Hanoi. Kim Doi and Quy Khe villages of Cam Hoang commune are about 4 kilometers from VBARD's Cam Giang branch. However, the surveyed households in these villages indicated that they knew about VBARD from television. Some farmers reported that they did not understand the lending procedure of VBARD. Other farmers also explained that whenever they wanted to borrow money from VBARD, firstly, they asked the village heads if it was possible for them to obtain loans from the bank at the time they needed credit. They wanted to know about availability of the bank's lending capital before deciding to apply for credit. They think that the village heads passed on relevant information on credit supply from the bank staff. In many cases, the village heads responded that VBARD had no capital for lending at that time. These farmers stopped their intention of borrowing money from this bank. This reflects that borrowers in these villages highly depended on information from the village head on credit availability. It was found that the village head also did not have adequate information on the credit program. Practically, the borrowers were in a position to contact directly VBARD staff to get information on credit availability. This implies that many households lacked relevant credit information from VBARD. It also shows that credit information asymmetry existed in the commune. This problem also occurred in the other communes studied.

Box 5. 1. Heavy dependence on village head to receive information on credit availability from VBARD

Mai Thi Lua, a farmer in Quy Khe village, asked her village head about the credit availability of VBARD. He said that loans were not available. She didn't find any information on credit availability from other sources. She also reported that VBARD did not provide information on its credit supply in the commune office, where farmers normally come to get information on various services in the rural area.

Source: In-depth interview, 2011

In addition, the influence of household characteristics on the lending decision of VBARD and PCFs is analyzed further in Table 5.14. It was detected that VBARD and PCFs provided the full required loan amount for households who proposed a mid-level loan amount, had a large land area, high value of assets and large poultry flocks and/or pig herds, as well as a high non-farm income. Households that applied for high amounts but had small landholdings, low value of assets and small pig herds and/or poultry flocks were provided loan amounts lower than required or were refused. Household heads of older age and a lower level of education had lower need for credit, but were approved for the full required amounts. It seems that the borrowers with a high need for a loan faced more constraints from the banks. The P values in Table 5.17 shown that age, education of household head, area of fish pond, size of poultry flock likely influenced the lending decision of VBARD and PCFs.

Table 5.14. Household characteristics and relation to VBARD and PCFs lending decision

Indicators	Unit	Approved required loan amount in full (n=41)		Approved part of required loan amount or refused to provide a loan (n=35)		P values
		Mean	S.D.	Mean	S.D.	
Amount of required loan	Mil. VND	24.5	9.8	58.5	21.5	0.00***
Amount of loan approved	Mil.VND	24.5	9.8	33.5	7.9	0.00***
Age of household head	Years of age	48.2	7.7	44.5	7.8	0.04**
Education of household head	Years of schooling	7.2	1.2	7.8	1.3	0.02**
Family size	Persons	4.5	0.7	4.8	1.3	0.26
Number of laborers	Persons	2.5	0.7	2.6	0.9	0.74
Dependency ratio		0.42	0.14	0.45	0.13	0.35
Area of cropland	1,000 m ²	2.7	1.2	2.6	1.2	0.84
Area of fish pond	1,000 m ²	3.9	2.5	3.0	2.2	0.17*
Total value of assets	Mil. VND	132	97	118	65	0.56
Size of poultry flock	Birds per year	226	101	195	87	0.16*
Size of pig herd	Head per year	20.9	14.3	17.7	9.3	0.30
Non-farm income	Mil.VND	24.3	16.7	22.6	13.3	0.63

Source: Household survey, 2011

Note: ***, **, * significant levels at 1%, 5% and 10%, respectively.

5.4. Factors affecting accessibility by animal producing households to credit from VBARD and PCFs

Main household assets include human, physical and social assets owned by farm households and related to the farmer's borrowing decision. These assets were considered by credit suppliers to decide their credit provision (Dufhues 2007).

As shown in Table 5.12, accessibility to credit from commercial banks (VBARD and PCFs) differed according to households. Of the total surveyed households (145), 69 decided to apply to borrow money whereas 76 households did not. Of those that applied for credit, 61 received loans whereas 15 households were refused. In addition, 41 borrowers obtained the full required loan amount and 20 households were provided part of the required loan amount. It should be noted that the amounts borrowed depended both on household decision and bank approval. Therefore, in this study, a household's accessibility to credit can be assessed by the amount borrowed from VBARD and PCFs.

Taking typical characteristics into account in the econometric model, this section aims to assess the factors affecting the credit accessibility of animal producing households to VBARD and PCFs. As stated in the chapter on the methodology, the Heckman model, including the Probit estimation and the regression, was applied. The description and expected signs of estimated variables in two steps is presented in Table 5.15.

Some household characteristics are likely related to the household's decision to borrow and the amount to be borrowed from the formal sector (Subsection 5.2.3 and appendix 2). However, in order to optimize estimation using the econometric model, a careful selection was made of the variables in the model. Firstly, all typical household characteristics were included in the model for estimation. Then, step by step, some characteristics were excluded in the model to obtain the best estimation (Appendix 3 and 4).

Table 5.15. Description of estimated variables

Variables	Types	Description of estimated variables	Expected signs of estimated variables	
			Probit estimation (first step)	Regression estimation (second step)
AGE	Continuous	Age of household head in year	+/-	+/-
EDUCATION	Continuous	Education of household head in year	+	+
LABOR	Continuous	Number of workers	+	+
GROUP	Binary	Wealth group: 1 if poor household, 0 otherwise	-	-
ACTIVITY	Binary	Main income activity: 1 if animal production, 0 otherwise	+	+
RELATION	Binary	Social relationship: 1 if household has job in local organization or has friends/relatives (on staff of local organizations or banks), 0 otherwise	+	+
POND AREA	Continuous	Surface area of fish pond in 100 m ²	+	+
COLLATERAL	Binary	Physical collateral: 1 if household has land use certificate, 0 otherwise.	+	Excluding

Source: Author

Table 5.16. Factors affecting the borrowing decision of animal producing households
(Probit estimation; n= 145 and Pseudo R² = 0.4754)

Variables	Coefficients	Z - statistic ¹	Marginal effect ²
AGE	0.018	0.890	0.026
EDUCATION	0.171	1.310	0.529
GROUP	- 0.939	- 2.890***	
LABORERS	0.363	1.470	0.317
POND AREA	0.045	2.650***	0.159
ACTIVITY	0.062	0.140	
RELATIONSHIP	1.124	2.410**	
COLLATERAL	1.404	2.010**	
Constant	- 4.517	- 2.710	

Source: Estimation from household survey data, 2011

Note: *** and ** significant levels at 1% and 5%, respectively; ¹ The Z-statistic is the ratio of the coefficient to the standard ratio; ² Marginal effects in percentage points, calculated at the mean values of the regressors

All estimated variables had expected signs. Some variables were statistically significant. Household heads with a high education level likely had a good understanding of the lending procedure of banks. Therefore, the probability of credit accessibility of households with a high level education was higher than that of other groups. However, the education level variable was insignificant.

The probability of credit accessibility positively correlated with the number of laborers and area of fish pond, showing that households with a high number of laborers and a large fish pond had a high credit requirement for their animal production. This might confirm that access to credit by households was important to absorb the labor provided by farm households as well as to promote animal production on the study site. Furthermore, marginal effects of the Probit model showed changes in the probability of accessing credit for additional unit increase in the independent or decision variables. Marginal effects were estimated but only used for explanation of the relation between continuous variables and the dependence variable because they may not be meaningful for binary variable. Regarding marginal effects in Table 5.16, the probability of credit accessibility increases 16% if the fish pond area increases by 100 m².

In order to explore the difference in commercial credit accessibility between poor households and non-poor households, the group variable was included in the model. The negative sign of the group variable indicated lower accessibility of poor households to commercial credit. In other words, the non-poor households tend to have more investment opportunities, leading to a stronger credit need.

According to Decision No. 67/1999/QĐ-TTg (the credit policy for agriculture and rural development, dated May 30, 1999), VBARD does not require physical collateral for loans under 10 mil.VND. In rural areas, VBARD and PCFs require physical collateral for most loans. Currently, the land use certificate is considered as unique physical collateral⁴ accepted by VBARD and PCFs. The physical collateral often does not reflect the real value, as no differentiation is made based on an assessment of the land. The different categories of land are given the same value (such as paddy rice or forest). During the loan term, the land use certificate is kept in the bank until the principal has been repaid. The land use certificate can bear only one loan, even if the loan amount is less than the value of the certificate.

The positive sign of the physical collateral variable implies that households having physical collateral had a higher probability of credit accessibility than households without physical collateral. It was found that all surveyed households desired to have access to credit. And 11% of them lacked physical collateral, which is why they did not apply to borrow money from VBARD. All of them indicated that they did not receive any information on the credit program not requiring physical collateral. This showed that the credit program not requiring physical collateral guided by Decision No. 67/1999/QĐ-TTg likely did not perform well.

⁴ VBARD also accepts the monthly salary or the house of borrowers as physical collateral. The monthly salary must be a stable income source. In Vietnam, civil servants normally have a stable income source in the form of their salary. The house is only accepted as physical collateral, while Vietnamese people may borrow money from VBARD to buy a house and use that house as their physical collateral. Generally, such items of collateral are available for people living in urban areas. Therefore, in rural areas, a land use certificate is a unique item of physical collateral, which is commonly available to meet VBARD's requirement for physical collateral.

In contrast to other countries, lack of physical capital in the form of farmland is not a significant access constraint. For instance, Sarap (1990) found that the smaller size of landholdings in India had an adverse effect on the access by small farmers to formal credit institutions.

Turning back to physical collateral, housing, production equipment and livestock were not accepted as physical collateral. However, these things also partly influenced the lending decision of VBARD and PCFs, because staff members visited the farms and took a look at their assets to estimate their value before deciding to provide a loan. Farmer households with a high value of assets and a large livestock herd may have better capability of loan repayment. Therefore, they were likely to have better credit accessibility. Dufhues (2007) detected that a high-value home had much greater influence on access to credit from a formal source than simply the land use certificate. Housing quality was probably used as a visible indicator of the general wealth of the household and can easily be assessed by local officials or credit officers. This may explain the considerable influence on the importance of housing in obtaining access to formal credit. The visible wealth of a household was seemingly very important for its access to credit. However, in this study, selected variables in the model excluded the value of housing, that of production equipment and of livestock because appearances of those variables did not bring a good estimation of the model.

In rural areas of Vietnam, information about the credit supply usually comes from the staff of social organizations and PCFs in communes and is very important for the borrowers to obtain a loan. It was found that the households that had a relationship with the commune staff, bank staff or had job in social organizations were better able to put together relevant credit information. The social relationship variable positively related to the probability of a household's credit accessibility. This implies that the social relationship of households likely let them on information on the borrowing procedure, which enabled households to be more confident about their borrowing application.

Table 5.17. Factors affecting the amounts borrowed by animal producing households
(Regression estimation; n= 61 and Adj R- squared = 0.655)

Variables	Coefficients	t - statistics
AGE	- 0.003	- 0.580
EDUCATION	0.042	1.200
LABORERS	0.108	2.290**
GROUP	- 0.916	- 6.930***
ACTIVITY	0.242	2.690***
RELATION	0.192	2.340**
POND AREA	0.004	2.560**
Mill ratio	0.010	5.700***
Constant	1.792	7.770***

Source: Estimation from household survey data, 2011

Note: ** , * , * significant levels at 1%, 5% and 10%, respectively.

Referring to the regression estimation, all variables had expected signs. However, some of them were statistically insignificant. It was detected that the surveyed households mainly purchased industrial feeds for their animals to increase animal productivity. Furthermore, the feed cost accounted for about 73% of the total variable costs. As a result, credit was necessary to purchase animal feed. The borrowed amount positively and significantly correlated with number of laborers, area of fish pond and animal-based income activity. The result revealed that households that had a high number of workers and a large fish pond and engaged in animal production as the main income source tended to borrow high amounts.

The survey result showed that young household heads with a high level of education wish to borrow high amounts of money for the expansion livestock production. However, age and education variables were insignificant in the econometric model.

As expected, the group variable negatively and significantly correlated with the amount borrowed, indicating a lower capability to manage and to expand animal production of the poor households than of non-poor households, leading to lower amounts borrowed by poor households than non-poor households. In addition, poor households may also be less confident in their ability to repay loans. The finding is supported by Li et al. (2011).

The social relationship variable positively and significantly correlated with the amount borrowed. It was explained that borrowers who had a close relationship with bank staff likely built trust in their loan repayment ability with the bank staff. As a result, the bank staff decided to provide larger loans to such borrowers. The influence of social relationships on credit accessibility is analyzed further in Subsection 5.5.

Most importantly, the Mill's ratio was found to be positive and significant, which suggested that the coefficients of the model were reliable and unbiased.

In summary, household characteristics, examined as a core analysis, had both an influence on the borrowing decision of households and the bank's approval of the amounts. It was found that the area of fish pond, physical collateral and social relationships positively affected the probability of credit access by animal producing households. Furthermore, area of fish pond, number of laborers, animal-based income activity and social relationships positively affected the amount borrowed. In addition, among animal producing households, poor households had lower credit accessibility and borrowed lower amounts than non-poor households.

5.5. Social network and its influence on credit accessibility by animal producing households

It is a general notion that rural financial markets in developing countries are imperfect (Yadav et al. 1992; Ho 2004). Indeed, it is a generally accepted fact that many rural households remain credit constrained despite numerous government policies to increase household access to credit. A major source of imperfections in rural credit markets is the lack of information that facilitates borrowing and lending transactions. Information asymmetries arise from the fact that, as many have argued, institutions for the protection of property rights and contract enforcement in developing countries are either absent or underdeveloped (Ho 2004).

This imperfection generally affects the economic performance of these countries but more seriously that of farm households. They are typically segmented into the formal, semi-formal and informal sectors, with the small market share of the formal and semi-formal sectors in

rural areas. The major reasons for the small share of the two sectors of the market in rural areas are related to asymmetric information, monitoring and contract enforcement problems. Besides, underdeveloped physical and communication infrastructures enormously influence the access of farmers and rural entrepreneurs to financial markets.

Many previous studies stated that in an imperfect credit market, social capital has a relation to the credit access of rural households (Okten and Osili 2004; Ajani and Tijiani 2009). Social capital is defined as the informal forms of institutions and organizations that are based on social relationships, networks, and associations that create shared knowledge, mutual trust, social norms, and unwritten rules. Social capital is in general accumulated through informal organizations based on social networks and associations (Durlauf and Fafchamps 2005).

The social network is one of the components of social capital. To enhance access to formal credit, the presence of social networks is necessary in many ways. On the one hand, a social network facilitates information flows between lenders and borrowers, which bring the borrowers closer to credit sources and prevent lenders from adverse selection and moral hazard. On the other hand, social networks, with their pressure, act as a guarantee, which keeps credit performance in the right direction.

In this study, the social network is investigated as the social relationship (i.e. relatives, friends, neighbors, staff members of mass organizations, village heads and moneylenders) for analysis of the linkage between the social network and credit access. It was detected that the credit accessibility of the surveyed households was also affected by their social network. Farm households with a strong social network likely have better credit access from both formal and informal credit sources than others with a weak social network. The positive influence of the social network on credit access of farmers in Hai Duong Province is illustrated in Table 5.18.

As in many countries, the common lending methods in rural Vietnam (including Hai Duong Province) are group lending and individual lending. VBSP has used the group lending method with the involvement of mass organizations and the local authorities to provide credit without the requirement of physical collateral. Targeted clients of VBSP must be members of a mass organization, which enables them to qualify to borrow money from VBSP. Being a member of a mass organization, the farmer creates his/her social network with other members and the staff of the mass organization, which opens opportunities of credit access to them, which can be seen as an advantage of the social network for many farmers.

In Hai Duong Province, the group lending method has been implemented by VBSP with the involvement of the staff of mass organizations and village heads with responsibility for borrower selection. The staff members of mass organizations and village heads live in the same village as the borrower, which enables them to get much information on the farmer household's characteristics (i.e. human and land resources, production and business, ability to repay a loan). This information is necessary for them to select farmers who qualify to become borrowers from VBSP. However, although this information is important for their decision on selection of borrowers, the social relationship or social network with staff of mass organizations is also very important. Among surveyed households, the households who are neighbors, friends and relatives of mass organization staff members and village heads normally have a strong social relationship. As a result, they had more opportunity to obtain loans from VBSP. Obviously, a social network with a strong relationship with staff of mass organizations is an advantage for some farmers, while it is a disadvantage for other farmers.

Table 5.18. Social network and its positive influence on access to credit by animal producing households

	Activities creating a social network	Positive influence on credit accessibility
Members of mass organizations	<ul style="list-style-type: none"> - Frequent participation in activities of mass organizations. - Sharing knowledge and experience on daily life, production and market information. 	<ul style="list-style-type: none"> - Having opportunity to borrow money as part of a VBSP lending group
Relatives	<ul style="list-style-type: none"> - Sharing and supporting labor in the critical harvesting season. - Supporting with a small amount of money or physical goods in special cases (i.e. going to hospital). - Sharing knowledge and experience on daily life, production and market information - Creating trust in daily life 	<ul style="list-style-type: none"> - Gathering relevant information on credit availability and lending procedure - Receiving loans from a relative, friend or neighbor
Friends		
Neighbors		
Staff of mass organizations	<ul style="list-style-type: none"> - Activities creating a social relationship between farmers and staff of mass organizations, village heads are the same as that between farmers and the relatives, friend and neighbors 	<ul style="list-style-type: none"> - Gathering relevant information on credit availability and lending procedure - Getting priority as a VBSP borrower
Village heads		
Bank staff	<ul style="list-style-type: none"> - Having the trust of bank staff due to timely paying off of old loans 	<ul style="list-style-type: none"> - Having greater opportunity to get a loan
Moneylenders	<ul style="list-style-type: none"> - Creating trust in daily life 	

Source: Group discussion, 2012

In Vietnam, the government continues to play a dominant role in the functioning of the economy. Under the management of the government, a variety of sociopolitical organizations exist, which play an important role, both socially and economically, in local communities. These organizations follow a hierarchical structure with official leaders at the central, province, district and commune levels to implement government strategies and policies. Therefore, the role of mass organizations continues to create both advantages and disadvantages for the rural credit policy.

The social network of farm households not only exists with people living in the same village and commune but also extends to outsiders (i.e. bank employees). Having a good social relationship with the bank staff also enabled farmers to get loans easily. This was a normal occurrence for the individual lending method which was mainly used by VBARD in Hai Duong Province. As previously presented, at the beginning step of the lending procedure, farmers can directly contact the bank staff or directly contact the village head, who was normally responsible for providing of information on VBARD credit availability. During the survey work, it was found that non-poor households normally directly contacted the bank staff

while poor households normally focused on their relationship with the village head to facilitate their borrowing. Some non-poor households reported that they were already familiar with the bank's employees so they did not need the involvement of the head of village in their borrowing. On the contrary, many poor famers indicated that they lacked information on VBARD's credit availability and were afraid of being refused. Therefore, the poor famers sought information on credit through the village head before meeting the bank's staff. This indicates that the non-poor famer also has a better social network with persons outside the commune and village, who finally decide to give loan, while the poor famers do not.

Box 5.2. Strong social relationship with staff of VBARD creating more successful opportunities for loan receiving

Nguyen Thi Thap, a farmer in Dan Chu commune, Tu Ky district owns about 2,000 m² of fish pond. She usually requires a large amount of money to purchase feed. She indicated that whenever she wanted to borrow money from VBARD, she gave a phone call to the staff of VBARD branch located in Tu Ky district to ask for a loan. Generally, it was not difficult for her to get a loan from this bank. In some cases, due to shortage of lending capital, she could not get a loan at a given time. Once lending capital became available, the bank's staff gave her a phone call. She also stated that she received loans from VBARD several times and repaid the loans on time, which established a strong social relationship and trust with VBARD's staff. It implies that a stronger social relationship and the trust enjoyed with the staff of VBARD create better credit access results with VBARD.

Source: In-depth interview, 2011

Like the social network that facilitates receiving loans from the formal sector, a strong social network with friends, relatives and village moneylenders also results a better chance for farmers to get credit from such informal credit sources.

Briefly, in the rural area of Hai Duong Province, the social network generally brings many benefits to farmers, including sharing of experience on daily life, production experience, market information and credit access. An emerging question is "How can the social network of farmers on the rural credit market to be improved?" From the above analysis, it can be recognized that the frequent participation in activities of mass organizations and helping one another in daily life create a strong relationship with many people in the village. It is a factor that improves the social network. One important factor is to create trust in daily life, which likely affects trust when it comes to borrowing money. A strong relationship and trust improve a social network on the credit market.

5.6. VBARD and PCFs' requirement of physical collateral for loans— Remarks and discussion

Collateral is a defining feature of a loan contract, together with the interest rate, maturity, size, and any possible covenants. Drawing from current theories, collateral helps banks to solve two main problems. First, collateral can limit the bank's losses in case of default by liquidating the collateral. Second, collateral can solve the problem of asymmetric information between banks and borrowers arising when private information about the borrower is not available to the bank. Theories about collateral solving the asymmetric information problem can be divided into two main streams. First, collateral can be used as a signaling instrument providing banks with valuable information about the borrower's solvability that would not be available otherwise. High-quality borrowers whose private information backs up their creditworthiness will not likely default on their loan and lose their collateral. Therefore, high-quality borrowers are more willing to pledge collateral and get more favorable contract terms than low-quality borrowers. Hence, collateral helps reduce adverse selection by signaling solvability (Stiglitz and Andrew 1981; Chan and Kanatas 1985).

The main collateral, accepted by the formal lenders in Vietnam, is physical collateral in the form of land use certificates. Social collateral in the form of references is also a widespread requirement, particularly for credit supplied by VBSP. During the innovation period initiated in 1986, a series of policies and laws in the agriculture sector, especially concerning land use, were issued. The most important policies were the 1993 land law and its revised versions (1998, 2001), the 2003 land law and Ordinances No. 64/CP (1993) and No. 02/CP (1994) of the government dealing with the regulation of agricultural and forestry land allocation. Under the 1993 land law, farmers were allocated land for long-term and stable use and were granted five rights of land use, namely the rights of transfer, exchange, lease, inheritance and mortgage. The duration of land allocation was 20 years for land used for annual crops and aquaculture, and 50 years for land used for perennial crops. The allocation could be renewed at the end of the period if the holder still had a need for the land.

In the 1990s, one of the most important access constraints to formal rural credit in Vietnam was the lack of physical collateral in the form of land use certificates (Hung and Giap 1999). Today, greater availability of land use certificates seems to have reduced this access constraint. The ongoing dissemination of land use certificates in recent years has brought an increasing number of households into possession of assets that are useable as collateral, and this has broadened the possible outreach dramatically (McCarty 2001; Dufhues et al. 2004)

Presently, some emerging problems relate to the requirement of physical collateral by banks in Hai Duong Province. Firstly, in implementation of the land law enacted in 1993, in Hai Duong Province, land use certificates were issued to farm households by the local authorities. The surveyed households, who were allocated land, had been granted their land certificates. It should be noted that under the 1993 land law, land for agriculture, forestry and housing construction are acceptable to receive a land use certificate. Any illegal use invalidates the land use certificate. However, the surveyed farmers indicated that VBARD and PCFs refused

to approve loans when farmers mortgaged the land use certificate for agricultural land. It is likely that the banks are concerned about the reallocation of agricultural land in 2013.⁵

Of the total surveyed households, 16 households (11%) do not possess land use certificates for housing construction. Despite having a credit need, they were not able to receive credit from VBARD or from PCFs due to the lack of a land use certificate or physical collateral. Two reasons leading to people not having a land use certificate are landlessness or illegal use of land for housing construction. All 16 households are young family and were not allocated land. For young landless households, they live with their elderly parents, who possess a land use certificate. In spite of owing of land use certificate, their elderly parents were unable to borrow money from the banks and make it available for their children to use because the parents are too old (over 65 year of age) and are barred from receiving bank loans. For the remaining young households, they converted their rice-growing land to house construction land, which is illegal use of the land. Consequently, they did not possess a land use certificate. This situation seems to be an increasing trend in Hai Duong Province nowadays.

Secondly, in Vietnam, lenders face enormous difficulty in enforcing pledges and mortgages (UNDP 1999; Riedel 2000). In Hai Duong Province, lenders also face the same problem. Banks are not usually allowed to seize land from defaulting farmers, even if the use rights have been pledged. Local authorities in the surveyed communes reported that the land market is still underdeveloped. Only a few households, in fact, sell or buy land, and it is usually traded within the village. In addition, nobody wants to buy land from households that are in debt or bankrupt, because Vietnamese people think that one who buys the land of unlucky household may be become unlucky too, in the future. Therefore, it is difficult for the banks to liquidate the land. VBARD and PCFs, two commercial banks, only put psychological pressure on farmers regarding the possibility of losing their land. None of the villagers or key persons interviewed knows any case of land liquidation in this area. If farmers find out that VBARD and PCFs are not going to liquidate their land in the event of default, the bank might end up in a landslide of bad debts. This finding is confirmed by Wolz (1997). It appears that the underdeveloped legal framework does not prove effective for the use of physical collateral as a risk management tool (Gottwald and Klump 1999).

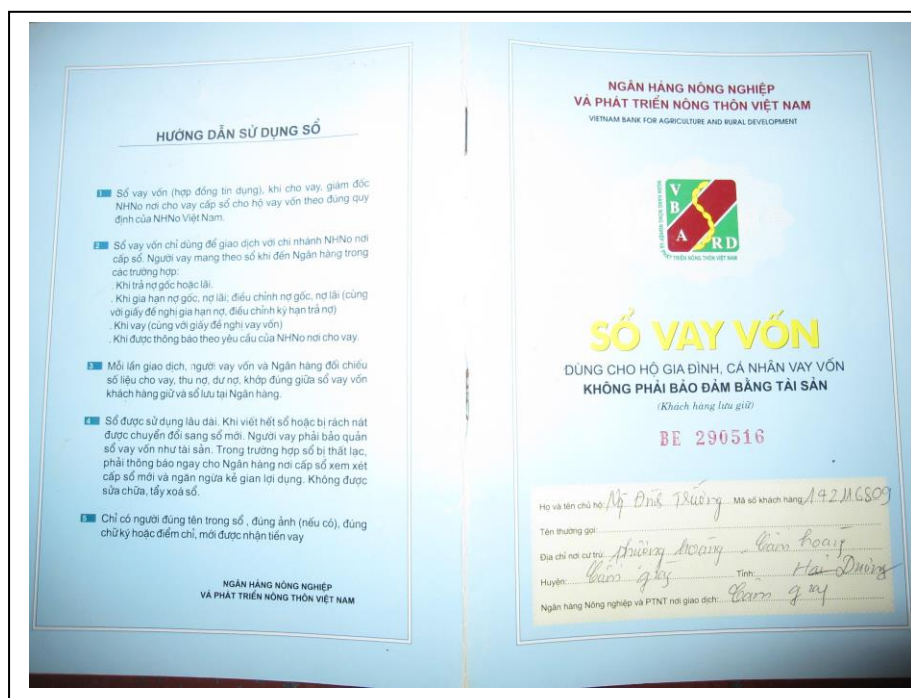
Thirdly, Decision No. 67/1999/QD-TTg permitted VBARD to provide loans under 10 mil.VND without physical collateral, which loans did not perform well in the study communes. In reality, many surveyed farmers reported that they had to mortgage their land use certificates to borrow money from VBARD. As noted, the role of VBARD is as important as that of the state-owned bank, a main credit supplier in rural areas. However, the favorable credit policy that aimed to make it easier for farmers to borrow money was not implemented up to the expectations of the government, because VBARD is likely overly concerned about loan repayment by farmers.

Decision No. 67/1999/QD-TTg was terminated in 2010. The Vietnamese government introduced Decision No. 41/2010/ND-CP in 2010 on credit policies for agricultural and rural development, enabling VBARD to provide loans less than 50 mil.VND to households without physical collateral. By late 2011, it was found that the local authorities and staff of mass organizations in the study communes did not receive any information on Decision

⁵ Under the 1993 land law, agricultural land is allocated for farmers to use for a period of 20 years. 2013 will end the period of 20 years of land allocation. The reallocation of land use will then be done for the next period.

No. 41/2010/ND-CP. Thus, this credit policy was implemented very late in Hai Duong Province. The weakness of implementation of Decision No. 67/1999/QĐ-TTg shows that farmers could have benefited from Decision No. 41/2010/ND-CP given the incentive it gave the staff of VBARD, local authorities and staff of mass organizations to promote rural loans.

Fourth, VBARD provides credit to farmers for their agricultural production, however the bank has been not accepted some agricultural outputs (rice, poultry, pork and fish) as physical collateral. On the contrary, VBARD provides credit for borrowers to buy housing and accepts it as physical collateral. Again, VBARD is responsible for the credit supply to the agricultural sectors. However, it is likely very much concerned about the risk in agricultural production.



Picture 5.1. A loan record book for credit not requiring physical collateral issued by VBARD

Source: Household survey, 2011

Box 5.3. Loan record book for credit granted without physical collateral issued by VBARD versus actual implementation of VBARD

Mr. Nguyen Dinh Thuong in Phuong Hoang commune showed his loan record book issued by VBARD. The cover page states that this book was for a loan granted without the requirement of physical collateral. Practically, he must submit his land use certificate to receive loan from VBARD. He stated that it was not a problem for him because he possesses his land use certificate. However, other poor farmers without a land use certificate were unable to get a loan from VBARD.

Source: In-depth interview, 2011

5.7. Strengths and weaknesses of the formal sector in rural lending in Hai Duong Province

The lack of farmer access to credit is not only determined by the human, physical capital and social characteristics of the animal producing households but also by the weaknesses of the rural lending network and the lending ability of credit suppliers.

5.7.1. Strengths and weaknesses of the formal sector

An assessment by farmers of the strengths and weaknesses of the formal sector in Hai Duong Province was carried out by group discussion (Table 5.16). The advantages or strengths of the formal sector had created opportunities for animal producers to receive loans in the recent years. Yet, the weaknesses of this sector also lead to constraints on the credit accessibility of households.

As mentioned, the formal credit sector provides credit with lower interest rates than the informal sector, particularly village moneylenders. Broadly, loans from the formal sector have a longer term or duration than those from the informal sectors. Therefore, many farmer households applied to obtain loans from the formal sector. However, there were several weaknesses in the formal sector with regard to lending in the rural area.

Regarding VBSP, some weaknesses in its performance were found. Firstly, VBSP's lending capital was limited. Indeed, the preferential interest rate on loans from VBSP was lower than that of the other formal credit sources. Consequently, attracting savings with a market interest rate was very hard because VBSP did not have an enough interest rate spread to cover the operating and financial costs required for the profitable simultaneous implementation of savings and lending services. Robinson (2001) stated that financial institutions that operate with subsidized loan portfolios cannot afford to be effective in both savings and lending. As a result, the lending capital of VBSP is limited because it mainly depends on government funding. This situation also was reported by the World Bank (2004).

Secondly, loan approval depended greatly on the approval of the village head and the staff of local mass organizations. As mentioned, VBSP used the group-reliant lending method. The selecting of borrowers by the village head and the staff of mass organizations resulted in some problems, including (i) credit groups and commune officials being reluctant to include poor households on the list of credit applicants. The non-poor households could obtain credit easily, because they were expected to be more reliable in using credit effectively and repaying credit, which is also confirmed by Dufhues et al. (2002) and Cuong (2008); (ii) the local authorities were also responsible for household poverty assessment, so lists of "poor" borrowers who received the credit subsidies often included local political leaders and their relatives and friends.

Thirdly, VBSP provided loans of a relatively uniform amount. As presented, most of the loans from VBSP were about 4.3 mil.VND. Fourthly, the loan disbursement of VBSP was irregular. It is detected that the more or less uniform amount of loans but irregular loan disbursement was caused by the heavy dependence on the capital provided by the government. In addition, loan products in the subsidized credit program were usually rigidly determined. The amount of

loans and terms of loans were prescribed with little regard to the needs of the borrower (Robinson 2001).

With respect to VBARD, the bank faced some weaknesses in rural lending. Firstly, VBARD in Hai Duong Province provided less information on the lending procedure and the credit programs. Although, VBARD also cooperated with the local authorities to provide credit to farmers, this cooperation mainly focused on how to secure their loans or to define the farmers able to repay their loans. Dissemination of information on the lending procedure and the credit programs was very limited. Lack of information on VBARD credit activities was found in all commune offices on the study sites.

Secondly, it was more difficult for farmers to receive loans in the last months of the year. At that time, farmers had a high credit requirement for their animal production to meet the high demand for meat and fish in Vietnam during the lunar New Year festival. However, farmers had great difficulty in getting their loans approved by VBARD. This problem can be explained that VBARD supplies credit not only for the agricultural sector but also for non-agricultural sectors (e.g. business, transportation, construction). Both sectors have a high credit need in the last months of the year. VBARD likely prefers to provide credit and may be very interested in lending to non-agricultural sectors than the agriculture sector.

Table 5.19. Strengths and weaknesses of the formal sector’s performance in Hai Duong Province

Strengths
<ul style="list-style-type: none"> - Providing credit with a lower interest rate than village moneylenders - Offering longer loan terms than the informal sector - Applying more simple lending procedures than before
Weaknesses
<ul style="list-style-type: none"> - VBSP: (i) Limited capital for lending; (ii) high dependence on approval from the village head and staff of local mass organizations for loan approval; (iii) irregularity of loan disbursement; (iv) uniformity of the loan amounts. - VBARD: (i) Higher interest rate than VBSP; (ii) shortage of lending capital in rural areas, particularly in the last months of the year; (iii) providing limited information on the lending procedure and credit programs; (iv) less interested in rural lending than urban lending. - PCFs: (i) Less attention to credit provision for agricultural production (including animal production) than non-agricultural businesses; (ii) requirement of physical collateral for all loans; (iii) higher interest rate than VBARD and VBSP; (iv) short loan terms.
Constraints to credit accessibility by animal producing households
<p>(i) Farmers lack information about VBARD’s lending program not requiring physical collateral; (ii) many farmers hesitated to borrow money for animal production from VBARD and PCFs due to lack of physical collateral, high interest rates and lack of information on lending; (iii) time of credit disbursement and amount of approved loan did not meet the credit need of the borrower.</p>

Source: Farmer group discussion, 2011

Concerning the PCF system, it is one of three main formal credit sources, located right in the communes. This characteristic brings a convenience of credit transaction to farmers. It is easier for farmers to contact directly PCF staff. Farmers also save time and transportation costs during their borrowing procedure. However, PCFs operate on two basic principles, to mobilize savings as much as possible and to cover the costs incurred out of the margins in interest rates. The system has to be self-reliant and not dependent on external funds. At present, PCF lending in rural areas also has some weaknesses.

Firstly, this institution likely prefers not to provide credit for the agricultural sector, but rather the non-agricultural sector. Farmers stated that PCFs preferred to supply credit for small businesses or expenses entailed to carry out labor contracts in foreign countries (Taiwan, Korea and Malaysia) because income generation from those activities was less risky than that from agricultural production.

Secondly, lending with the requirement of physical collateral was applied for all loans because the main objective of the loans was to create maximum business profits. Like VBARD, PCFs only accepted the land use certificate as physical collateral for lending money. With the expansion of transaction offices to the commune level, PCF staff likely had a better understanding of the characteristics of farmer households. However, PCFs had not introduced any flexible requirement for their lending.

Thirdly, the source of capital for lending was limited and mainly depended on savings mobilization from local savers. However, the annual amount of savings has been low, due to lack of trust of the local people. In addition, the State Bank of Vietnam allows PCFs to charge higher interest rates than other financial institutions. Therefore, PCFs provided credit with a higher lending interest rate than VBARD and VBSP.

Some weaknesses of the formal credit sector thus created some constraints for the credit accessibility of farmers. Firstly, the uniformity of loan amounts granted by VBSP and irregular disbursement of loans did not meet the actual credit needs of farmer households, especially those that wanted to borrow money for animal production. Secondly, farmers lacked information on the credit program from VBARD not requiring physical collateral. Thus, none of the surveyed farmers could receive credit without providing physical collateral, which was stated in the credit policy. Thirdly, many farmers hesitated to borrow money for their animal production from VBARD and PCFs due to their inability to meet the physical collateral requirement, the high interest rate or a lack of information on lending.

Using the relative quantitative assessment, the weaknesses of the formal sector were also investigated further. During the household survey, farmers were asked to point out some problems that impeded their credit access. Table 5.17 shows the number of persons who actually faced the aforementioned problems, divided by the total number of persons interviewed. Generally, the problems that farmers faced with were similar for VBARD and PCFs. The problems were different in some respects for VBSP due to different lending methods between VBSP and the two other banks.

Table 5.20. Farmer complaints about credit supply from the formal sector
Unit: Percentage

Problems	VBSP	VBARD	PCFs
Requirement of physical collateral for all loans		70	70
High interest rate		80	85
Short loan term		50	80
Lack of information on the lending procedure and credit program	50	70	30
Harder to access credit during last months of the year	80	70	75
Heavy dependence on staff of mass organizations and village head for loan approval	65		
Irregular loan disbursement	90		
Complex lending procedure	30	10	5
High transaction costs		35	15
Requirement of gift for the bank staff		17	7

Source: Household survey, 2011

Note: Problems 1 to 6 were raised for all surveyed households. Problems 7 to 9 were raised for households who received loans.

5.7.2. Strengths and weaknesses in rural lending involving staff of local mass organizations

With respect to the lending network in the rural areas of Hai Duong Province, the staff members of mass organizations are involved in some steps of the lending procedure of VBSP and VBARD, particularly VBSP. Their input also influences the access of farmers to formal credit. It was found that staff members of mass organizations live in the same village and have responsibility to provide credit information about VBSP and VBARD to farmers. They are considered as responsible for the credit information flow from the banks to farmers. Thanks to the expansion of the mass organization network to the village level, loans not requiring physical collateral and subsidized interest rates from VBSP, which provided for poor households, slightly increased in recent years.

Regarding strengths, staff members of mass organizations live in the same commune as the farmers and provide credit information for farmers. The involvement of the staff of mass organizations in rural lending allows farmers to save time and transportation costs. With respect to weaknesses, the staff of mass organizations involved in rural lending showed some weaknesses. Firstly, staff members of mass organizations received only some cursory training provided by VBSP and VBARD. Thus, they did not have much ability in terms of loan monitoring. Secondly, they typically had worked with mass organizations only for a short period (four years). Their jobs depended on election results at the communal level. They did not have any motivation for further study to improve their management ability. Thirdly, they spent much time for working with the staff of VBSP, VBARD and farmers. However, they

received little pay from the banks. This situation also did not provide an incentive for them to work efficiently.

Some mentioned weaknesses that caused several constraints negatively influencing the credit accessibility of farmers. Firstly, the staff members of mass organizations likely avoid promoting the credit program of VBARD with no physical collateral requirement due to concern about ability borrower solvability. Consequently, many farmers did not get access to credit from VBARD. Secondly, they preferred to select farmers who were not poor or their relatives for VBSP loans.

CHAPTER VI : INFLUENCE OF CREDIT AND NON-CREDIT FACTORS ON ANIMAL PRODUCTION

In Chapter 5, it was found that credit supplied by VBARD and PCFs was mainly used to purchase variable inputs. Due to limited borrowing, only very small amounts of credit were used for upgrading shelters or fish ponds and purchasing production equipment.

Therefore, the following analysis focuses on credit use for variable inputs. This chapter explores the influence of credit and non-credit factors on animal production. Its empirical findings suggest that animal production needs to be improved and animal producer incomes increased. In order to achieve the general objective, this chapter is divided into eight detailed sections. The first, second and third explain the involvement in animal production of the surveyed households, describe the scale of their animal production and analyze the main constraints in both production and marketing. The fourth section discusses income from all income-generating activities of the surveyed households. In addition, the income of the surveyed households is also compared with some representative groups to give evidence of the necessity of increasing animal producer incomes. The fifth section provides a detailed analysis and comparison of costs and economic return from animal production of different groups, especially the credit constrained group and the non-credit constrained group. Then, an analysis of the influence of credit constraints and non-credit factors on reduction of income is investigated in the sixth section. The seventh section deals with household expenditures and the farmer's need for credit to invest in fixed assets. The eighth section focuses on loan repayment. The final section explores family labor employment and gender issues in animal production.

6.1. Household's involvement in animal production

Many researchers agree that agricultural diversification is a key component of rural development in Vietnam. Given the limited prospects for growth of rice production and changing patterns of demand both in Vietnam and in world markets, animal production development appears to be an important pillar of any improvement strategy for agriculture in Vietnam. Such a strategy aims at achieving higher and more stable rural incomes, reducing migration from rural to urban areas, making the farming system more sustainable in the long run and alleviating rural poverty (VACI 2001). The contribution of the livestock sector is well recognized as a tool to alleviate poverty in rural areas. It significantly contributes to the total supply of nutrients in the food intake of human labor (Abedulla et al. 2009). During the household survey, reasons for involvement of farmer households in animal production were explored. For the animal-based group, the main reasons associated with animal production were food for household consumption, increasing income, effective use of family labor, and keeping a viable fish pond. Ranking next in importance were unskilled workers needing to find non-farm jobs (factory work, labor contracts in foreign countries and the services sector) and savings. Keeping livestock for consumption of crop residues and manure production were less important compared to other reasons.

For the non animal-based group, the crucial reasons for involvement in animal production also were to increase income and household consumption and to make effective use of family labor due to less opportunity for employment in non-farm jobs. The next most important reasons were savings, use of crop residues, manure production and keeping of a viable fish pond. It indicates that, in response to the increasing demand for meat and fish of consumers in the urban area, farmers in Hai Duong Province selected animal production as an income-generating activity. Animal production also provided a food source for their family's consumption. Furthermore, the land area for crop production is limited due to the high population density of Hai Duong Province. Animal production allows farmers to effectively use their labor throughout the year. Currently, farmers spend less time on crop production than ten years ago due to machines replacing manual labor for land preparation and harvesting. It is important to highlight that in both groups, the workers mainly have only a lower secondary school degree. Only some of them obtained an upper secondary school degree. Furthermore, on average, the farmers, who were about 40 years of age, were too old to be employed in factories or companies. It is found that most factories in Hai Duong Province prefer laborers from 18 to 35 years of age, because young people with an education can be more easily trained to be skilled workers than older ones. On the other hand, keeping animals for manure and making use of crop residues was more important for the non animal-based group than the animal-based group because they lacked money to buy large quantities of chemical fertilizers for crop production. Similarly, keeping animals simply for savings also was more important for the non-animal based group. They indicated that keeping animals allowed them to save their money. This source of savings is very necessary for paying school fees for their children (Table 6.1).

Table 6.1. Involvement of surveyed households in animal production
Unit: Percentage

Reasons	Animal-based group	Non animal-based group
Increasing income and household consumption	100	100
Effective use of family labor	80	71
Keeping a viable fish pond	74	30
Less opportunity for non-farm jobs	66	85
Savings	30	38
Use of crop residues	27	40
Manure for crop production	25	35

Source: Household survey, 2011

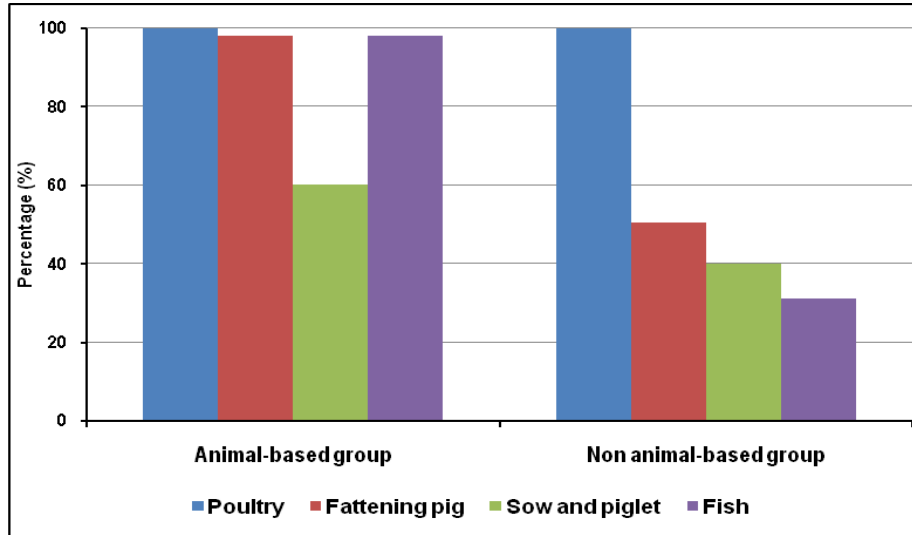


Figure: 6.1. Percentage of households raising poultry, pigs and fish

Source: Household survey, 2011

Raising animals of various kinds during the same year is typical of small animal producers in Hai Duong Province and throughout Vietnam. Diversification helps farmers cope with the negative influence of various factors such as disease and volatility of selling prices and allows them to reduce risks. Figure 6.1 presents the proportion of households raising different kinds of animals. In both groups, 100% of households raised poultry; 98% of households in the animal-based group raised fattening pigs, while 50% of households in the non-animal-based group did. Both groups also raised sows and piglets. Additionally, 98% of households in the animal-based group engaged in fish production, while 31% of households in the non-animal-based group did. These figures indicate that involvement in animal production was relatively different between two groups.

6.2. Scale of animal production

The animal production scale of the surveyed households in 2010 is presented in Table 6.2. Regarding the flock size of poultry per year, the number of poultry was 199 birds per surveyed households, 223 for the animal-based group and 183 for the non animal-based group. There was a relative difference in poultry flock size between the animal-based group and the non animal-based group. The number of fatling pigs and area of fish pond of the animal-based group were also considerably higher compared to those of the non-animal based group.

In terms of the frequency of poultry flock size, 69% of surveyed households raised less than 100 birds while 31% of surveyed households raised more than 100. It was seen that 49% of households in the animal-based group kept less than 100 birds while 71% of households in the non animal-based group kept the same size of poultry flock. In contrast, 51% of households in the animal-based group raised more than 100 birds, whereas 29% of households in the non animal-based group did (Figure 6.2).

Table 6.2. Scale of animal production

Indicators	Total		Animal-based group		Non animal-based group		P values
	Mean	S.D.	Mean	S.D.	Mean	S.D.	
Size of poultry flock (birds per year)	199	83	223	76	183	70	0.10*
Size of fatling pigs (head per year)	20	11.9	22	12.6	9	3.3	0.00***
Size of sows (head per year)	1.5	0.7	2	0.4	1	0.7	0.20
Area of fish pond (1,000s m ²)	2.8	2.3	3.5	2.4	1.4	1.2	0.00***

Source: Household survey, 2011

Note: *** and * significant levels at 1% and 10%, respectively.

With respect to the herd size of fatling pigs per annum, households raised 20 head of fatling pigs. On average, the animal-based group raised 22 head while the non-animal-based kept 9 head. The number of fatling pigs of the animal-based group was significantly higher than that of the non animal-based group. This reflects the important income-generating role that pig production plays for the animal-based group. It was also found that pig production requires a high expenditure for feed. Due to low-income and lack of money for feed purchasing, both groups raised only a small number of pigs.

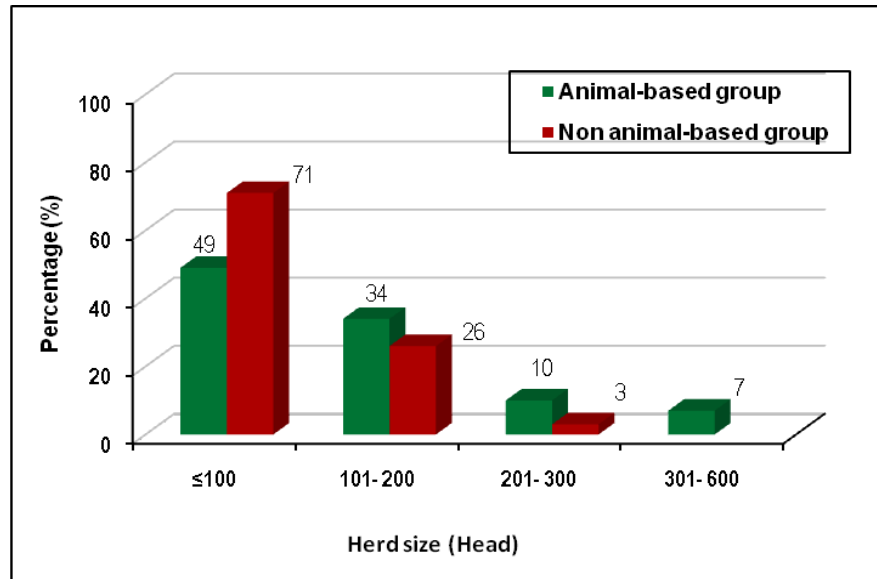


Figure 6.2. Distribution of poultry flock size

Source: Household survey, 2011

Regarding the distribution of fatling pigs, 87% of surveyed households raised less than 30 head and the remaining households raised 31 to 60 head. It is seen that 51% of households in the animal-based group and 97% households in the non-animal-based group raised less than 20 head; 26% of households in the animal-based raised 21 to 30 head, whereas 3% of households in the non animal-based group kept the same herd size (Figure 6.3). The distribution of fatling pigs in both groups reflected the differences in herd size among households, which was partly affected by the capital owned by the households as well as their credit accessibility as both groups desired to expand their pig production. The fatling pig herd size of the surveyed household was much lower than that of the herd size of commercial pig farms in the Red River Delta region. Hung (2011) showed that in Hung Yen province, commercial pig farms raised an average of 296 head of pigs in 2010.

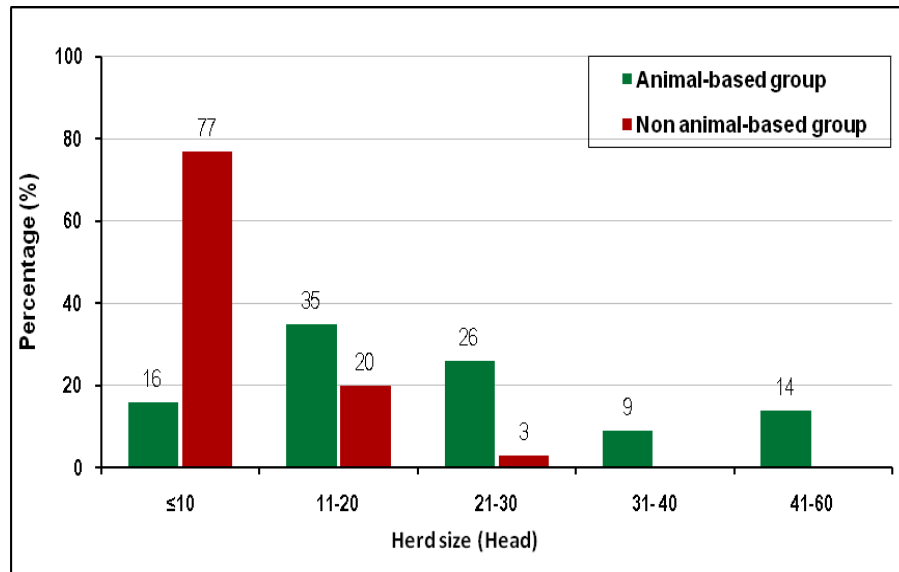


Figure 6.3. Herd size distribution of fatling pigs

Source: Household survey, 2011

The surveyed households not only engaged in livestock production but also engaged in fish production. The distribution of fish pond area is presented in Figure 6.4. It can be seen that 29% of households in the animal-based group owned a fish pond of less than 2000 m², meanwhile 77% of households in the non animal-based group had the same range of area. The animal-based group had a larger area of fish pond than the non animal-based group. It shows that a fish pond was an important asset for income generation in the animal-based group.

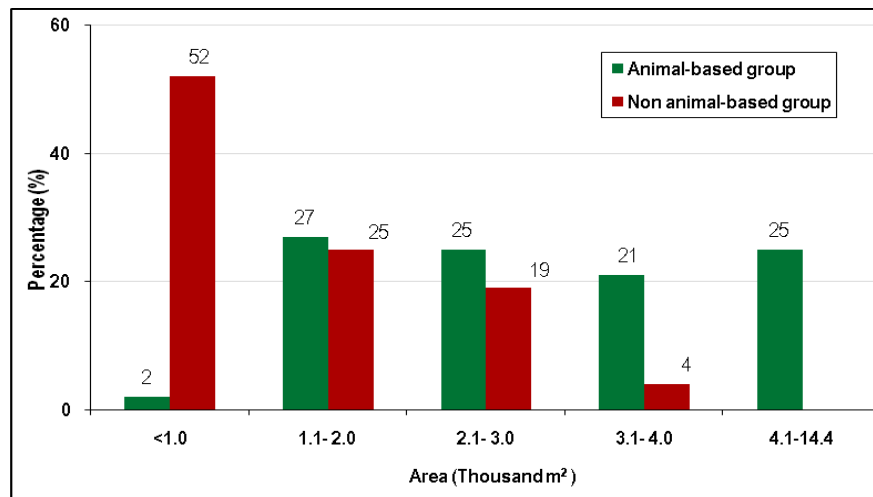


Figure 6.4. Distribution of fish pond area

Source: Household survey, 2011

6.3. Main constraints to animal production and marketing

Before looking at strategies and policies to encourage the future improvement of animal production, it is necessary to understand the constraints which impede animal production. Animal production relates to various aspects, consisting of credit access, input use, disease management and technical knowledge. Besides production, marketing is also a crucial factor for animal producers. Generally, the economic return from animal production is influenced by many factors.

Before we implemented the household survey, 12 farmers were invited to participate in the group discussion to identify the main constraints affecting animal production. Then, the result of the group discussion was verified by using the detailed household survey. It showed that the surveyed farmers confronted constraints to both animal production and marketing, including animal disease, substantial rapid increase in feed prices, lack of guidance for feed selection, credit access, limited access to relevant market information, high volatility of output prices and weak bargaining power (Table 6.3).

Table 6.3. Constraints to animal production and marketing

Constraints	Internal reasons (directly related to farmer)	External reasons
Animal disease	- Weak capability of farmers in disease prevention	- Poor veterinary service - Poor disease detection, surveillance and control in veterinary system - Late provision of disease prevention training for farmers - Lack of veterinary staff for aquaculture
Substantial rapid increase in feed prices	- Small amount of feed purchased at one time and from feed retailer in villages	- Importing of raw materials for industrial feed processing
Lack of guidance for feed selection		- Lack of information from agricultural extension institutions
Credit access constraints	- Lack of physical collateral - Limited access to information on credit program	- Weakness of formal credit sector in agricultural credit provision
High volatility of output prices		- Animal disease consequences - Smuggling of animals and animal products from China.
Limited access to relevant market information		- Weakness of local extension institutions in provision of market information
Weak bargaining power	- Lack of linkage of production and linkage of marketing among farmers	

Source: Farmer's group discussion and household survey, 2011

6.3.1. Animal disease

Animal disease had negative effects on the animal production of the selected households. It was found that the primary reason for animal disease loss was because farmers had little capability in the realm of disease prevention. Furthermore, poor veterinary service (disease surveillance and control), poor disease detection, lack of qualified veterinary staff for aquaculture and untimely provision of disease prevention training for farmers were also factors relating to losses due to animal disease.

✓ **Weak capability of farmers in disease prevention**

It was detected that poor knowledge of disease prevention was the main reason for weak capability in disease prevention. Many farmers raised pigs and chickens in poorly constructed shelters with inadequate hygienic. Their awareness of sanitation was limited. Generally, the animal-based group had more experience in disease prevention than the non animal-based group. However, many times, the pigs and chickens of the animal-based group were had not been vaccinated (Table 6.4). About half of the surveyed households participated in the technical training class, but they still had not implemented an appropriate method for prevention and treatment of animal disease. About 60% of the surveyed households reported having had to deal with pig disease, mainly porcine reproductive and respiratory syndrome (PRRS, also known as blue-ear pig disease), foot-and-mouth disease, porcine epizootic diarrhea and pasteurellosis. The PRRS outbreak did not have a clear pattern. Surveyed households also reported chicken diseases, mainly Newcastle disease, pasteurellosis avium, chicken cholera, Marek's disease, chicken pox, coccidiosis and salmonellosis avium.

In addition, the pig pens and chicken sheds were largely open. Outsiders (mostly traders and neighbors) could easily access them without any preventive measure. It should be emphasized that some pig raisers, chicken breeders and farmers did not inform the relevant agencies about sick pigs and chickens. Also, they try to sell them or dispose of them in an open environment. That was one serious reason leading to the epidemic spreading. The problem of epidemic was worsened because some farmers tend to sell their sick or dead animals to recover part of their capital. However, in the communes, veterinary workers were not often paid and had no incentive to report diseases. Besides the low knowledge of disease prevention on the part of farmers, poor hygiene and improper waste treatment in rural areas also contributed to disease infections. In the first three months of 2010, many communes in Hai Duong Province were hit by PRRS, affecting about 9,800 pigs, with 7,300 of them destroyed. Animal losses were estimated at about 20 bil.VND (DARDH 2010). Animal disease was normally not reported due to lack of knowledge.

✓ **Poor veterinary services**

The Veterinary Ordinance of Vietnam was approved by the National Assembly in March 2004. It covers disease prevention and control, quarantine and veterinary hygiene, drug management, and the requisites of veterinary practice, although in a very general fashion. The provincial, district and commune levels of veterinary agencies deliver services and enforce national regulations at the local level. It was found that implementation of the Vietnam's Veterinary Ordinance was weak on the study site.

Regarding vaccination against animal disease, Decision No. 63/2005/QĐ-BNN was enacted by the Ministry of Agriculture and Rural Development in October 2005 to promulgate regulations on compulsory vaccination of livestock. To support farmers, some vaccines against pig diseases (including swine fever, pasteurellosis, erysipelas, and foot-and-mouth disease) were provided by veterinary staff, funded by the Vietnam government. However, vaccinations were provided twice a year while farmers produce at least three cycles in a year. Meanwhile, no farmer or private veterinary service provider was allowed to keep the mentioned vaccines. Therefore, many farmers raised pigs that were not vaccinated. In addition, the improper use of injection syringes was also reported, where the syringe was re-used without proper cleaning. In areas with a high stock of pigs and a limited number of veterinary staff, poor storage conditions for the vaccine might also have affected the vaccine's quality. As for the other vaccines for pig diseases (PRRS, swine enzootic pneumonia, paratyphoid), farmers could purchase them from private dealers. It was detected that not all farmers applied those vaccines because of their high cost and they lacked certainty about the effectiveness of disease prevention. Furthermore, private dealers lacked facilities for proper vaccination preservation, thus resulting in a quality loss for those vaccines.

Concerning government veterinary staff and village workers, the head of the Hai Duong Provincial Veterinary Department reported that in 2010, there were 19 employees working in the Hai Duong veterinary department and 41 in district veterinary stations. With a total 256 communes, each commune had one or two persons who were not government employees working as veterinary workers and paid about 1 mil.VND per month. With respect to the level of training, the majority of employees of veterinary service units in communes and villages had a relatively low training level. The proportion of graduate veterinarians on the staff of veterinary service units in the communes was much lower than in the district and provincial veterinary service units. It was also reported that the number of private veterinarians gradually increased along with the development of the commercial livestock industry in Hai Duong Province. Private veterinary workers who worked as veterinary shopkeepers and distributors of animal feeds became salesmen for pharmaceutical companies while providing veterinary services to livestock farmers. There were one or two private veterinary workers per commune. The head of the Hai Duong Provincial Veterinary Department indicated that the number of veterinary staff and workers was generally adequate. The low salaries of veterinary workers at commune units were a disincentive to work hard.

During the survey work, farmers were asked about their vaccination and disease treatment for pigs, chickens and fish. The vaccination and disease treatment for pig production was presented as an example to analyze current performance of veterinary services of the surveyed households. As shown in Table 6.4, pigs were vaccinated by farmers, veterinary workers and others (such as neighbors or friends). And 44% of farmers in the animal-based group asked veterinary workers to vaccinate their animals while 41% of farmers in the non animal-based group did. Because the animal-based group had more experience in the use of medication, the portion of farmers who vaccinated their own pigs was 33% for the animal-based group while it was 19% for the non-animal based group. It should be noted that the portion of farmers who did not vaccinate was 15% for the animal-based group and 35% for the non animal-based group. This implies that for both internal and external reasons, farmer capability in the realm of disease prevention was still weak.

Table 6.4. Pig vaccination by surveyed household

Unit: Percentage

Done	Animal-based group	Non animal-based group
By farmers	33	19
By veterinary workers	44	41
By others	8	5
No vaccination	15	35
Total	100	100

Source: Household survey, 2011

On the study site poor veterinary service was not only reflected by poor performance of the vaccination service, but also by treatment for disease. Farmers mainly treated their animals by themselves as disease was detected. The portion of surveyed households who asked private veterinarians for pig disease treatment was 35% for the animal-based group and 15% for the non animal-based group. Some farmers also asked their relatives and neighbors for disease treatment, especially the non animal-based group. In addition, where farmers did initiate pig disease treatment, it was because they had experience in disease treatment.

Key reasons why farmers decided to apply disease treatment were also identified: 52% of farmers in the animal-based group and 38% of farmers in the non animal-based group reported that they had experience in treating common diseases. And 8% of farmers in the animal-based group and 16% of farmers in the non animal-based group complained that they had to wait for private veterinarians to come. Notably, the proportion of farmers in the animal-based group who did not have confidence in private veterinarians was 15% for the animal-based group and 10% for the non-animal based group. In addition, farmers also reported that they were reluctant to ask private veterinarians because the cost of disease treatment was prohibitive, namely 24% for the animal-based group and 36% for the non animal-based group (Appendix 7). The current situation of common disease treatment is that at the commune level, veterinary services are still inadequate, which impedes access to veterinary services by farmers. The relatively low knowledge level of farmers about animal disease and the weakness of veterinary services were major reasons for the low adoption of proven effective disease control measures.

✓ **Poor disease detection, surveillance and control in the veterinary network**

Field-level disease surveillance and control are carried out by sub-departments of the Animal Health Department of Hai Duong Province, managed by the Hai Duong People's Committee. At the grassroots level, veterinary workers included private veterinarians and public veterinarians who are partially paid by the communes. Overall, these veterinary workers had expertise in the livestock sector. However, the veterinary system lacks coherence in the effective use of these veterinary worker resources and the connectivity between the different levels, from the commune to the national level. Close connectivity in the veterinary system is very necessary for a fast flow of reliable information on diseases. Moreover, the veterinary system was mainly a passive surveillance system, reacting to disease reported by field workers. It has very limited capacity for assessing pathogens and disease occurrence.

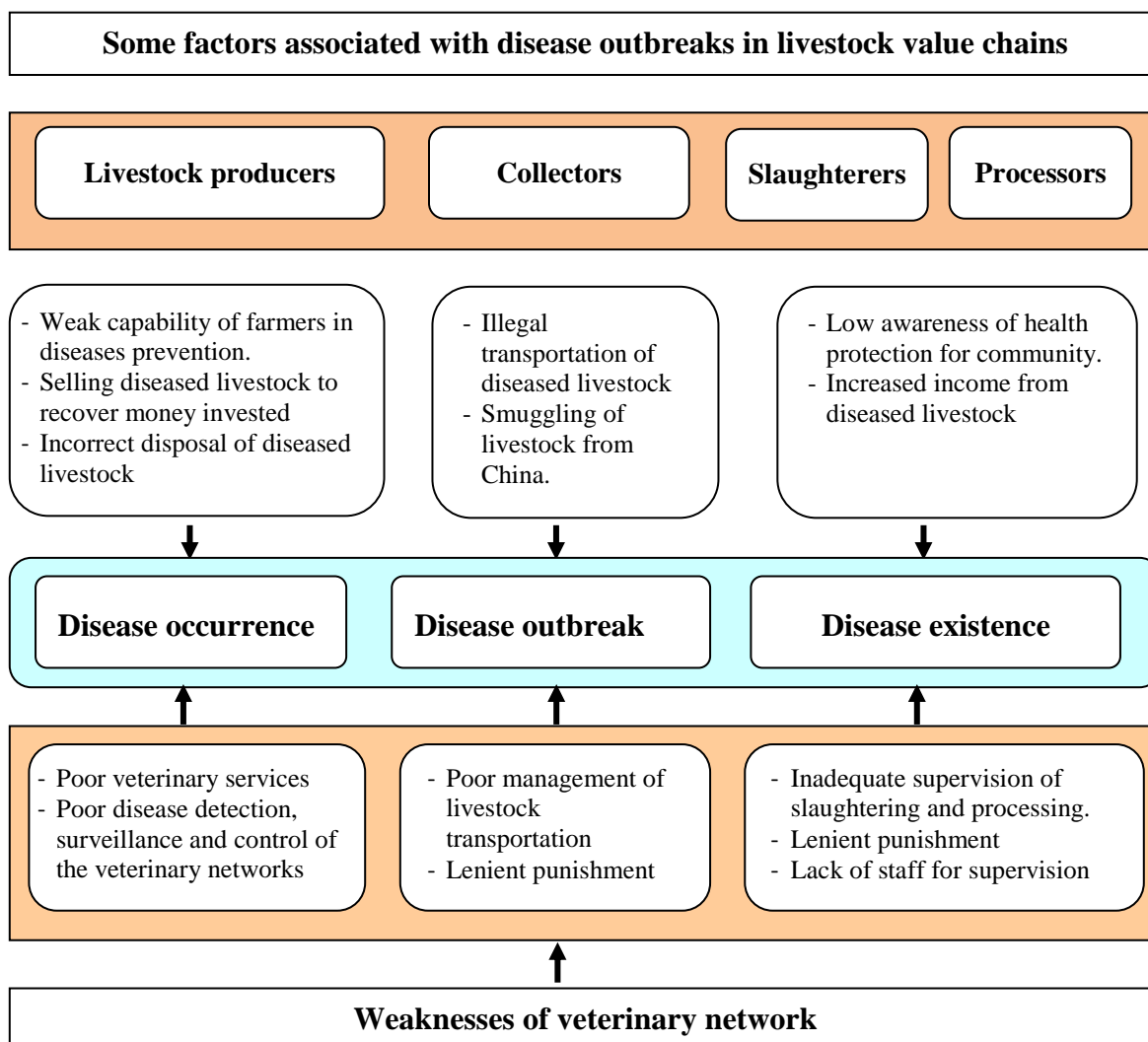


Figure 6.5. Poor disease detection, surveillance and control of the veterinary network in Hai Duong Province

Source: Farmer group discussion, 2011

Livestock disease is not only associated with production, but also with transportation and the meat processing stage. As shown in Figure 6.5, producers, collectors, slaughterers and processors in Hai Duong Province are the main stakeholders in the livestock value chain. Their awareness of livestock disease was weak. In addition, the veterinary network was also poorly managed. Both of these reasons systematically resulted in the occurrence, outbreak and persistence of disease. Furthermore, Highway 5 passes through some districts of Hai Duong Province. It is the main connection between Hanoi and Quang Ninh Province, which borders on China. Smuggled pigs and chickens from China were commonly transported on the Highway 5 to Hanoi. Therefore, smuggling of pigs and chickens were a ready source of livestock disease in Hai Duong Province.

✓ **Late provision of disease prevention training for farmers**

The surveyed farmers reported that once every year or two a training class in livestock production was organized by a commune farmers' union and the district extension station. It provided farmers with technical knowledge on livestock nutrition, disease prevention and treatment. However, the training class was normally organized after an outbreak of livestock disease. The untimely provision of disease prevention training resulted in a weakness on the part of farmers to prevent disease. This situation indicates to some extent the low quality of extension services on the study site. The farmers also noted that technical training classes for aquaculture were only rarely organized.

✓ **Lack of veterinary staff for aquaculture**

On the study site, there was a shortage of veterinary staff qualified in aquaculture. Of the four communes selected for data collection, there was no veterinary staff for aquaculture. There was also a shortage of veterinary staff for aquaculture in the other provinces located on the Red River Delta.

Given the weakness of animal disease prevention, a relatively high number of surveyed households faced animal losses in 2010. Generally, poultry, pig and fish losses occurred in different stages of the production cycle. The percentage of households faced with fish loss was the highest in 2010. Of total fish producers, 40% of households in the animal-based group and 45% of households in the non animal-based group suffered fish disease. Farmers reported that they annually faced fish disease due to the lack of technical knowledge, low quality of water in their fish ponds and changes in weather conditions. The percentage of households losing pigs was 30% for the animal-based group and 35% for the non animal-based group because pig production was affected by PRRS in first three months of 2010. Poultry production suffered the lowest level of losses, with 20% of households in the animal-based group and 29% of households in the non animal-based group reporting chicken disease. It was due to common pathogens. Generally, the percentage of households with animal losses the animal-based group was higher than that of the non-animal group. However, the lost value of the animal-based group was lower than that of the non animal-based group because the herd size of livestock and the scale of fish production of the animal-based group were higher than those of the non animal-based group.

6.3.2. Substantial rapid increase in feed price

Agriculture in Vietnam is shifting from traditional to industrial farming. Because of a high demand for animal and poultry feed as well as the open market-oriented policies of the government of Vietnam, many feed mills were established in just a short time. The feed mills include foreign companies and joint ventures such as CP Group, Proconco (a France-Vietnam joint venture), Cheljidang, Uni-President, New Hope, Cargill, etc. The industrialization process is bringing a higher demand for feeds and is pushing its growth to 15%-17% each year (Swiss Business Office in Vietnam 2012).

According to the Information Center of the Ministry of Industry and Trade, the total demand for animal feeds in 2010 was 19.7 million tons. Manufactured feed was 11 million tons (56%),

6 million tons (30%) was imported and the balance (14%) was mixed manually by family farms from available agro-products. Local feed ingredients meet only 30-40% (in value) of the local production demand, the rest (60-70%) has to be imported. According to an expert in animal feeds from AgroMonitor Vietnam, Vietnam imported 90%-95% of its soymeal and fishmeal, 50% of its corn, 80% of premixes and 100% of minerals and vitamins (Swiss Business Office in Vietnam 2012).

In the last few years, there has been a sharp increase in the price of many raw materials used in livestock feed production. Soymeal takes 60% to 70% of the production cost of concentrate feed and 20% to 30% of the complete feed cost. Prices of the two main ingredients have been continuously on an upward trend. In addition, the price of domestic maize rose with the international prices, as the world use of maize in ethanol production is increasing. In 2010–2011, the average price of maize was 7,100 VND per kg and increased by 500 VND per kg from the previous week (Figure 6.6).

The heavy dependence on imported ingredients such as soybeans and maize, high import taxes, and low domestic yield of these inputs have been considered as the causes of the high livestock feed prices. Industrial feed prices in Vietnam are around 10%-15% higher than in other countries of the region, such as Thailand and China. It is estimated that Vietnam imports about 20%-30% of the volume of raw materials used for livestock feed production, which accounts for 45% of the total value of raw ingredients. High prices of livestock feed directly affect producers as they translate into higher production costs, especially when the prices of livestock products do not increase sufficiently to cover the increased costs. Given the higher complete feed prices, it would seem that the changes in raw material input costs were passed on to the buyer (Phuong et al. 2010).

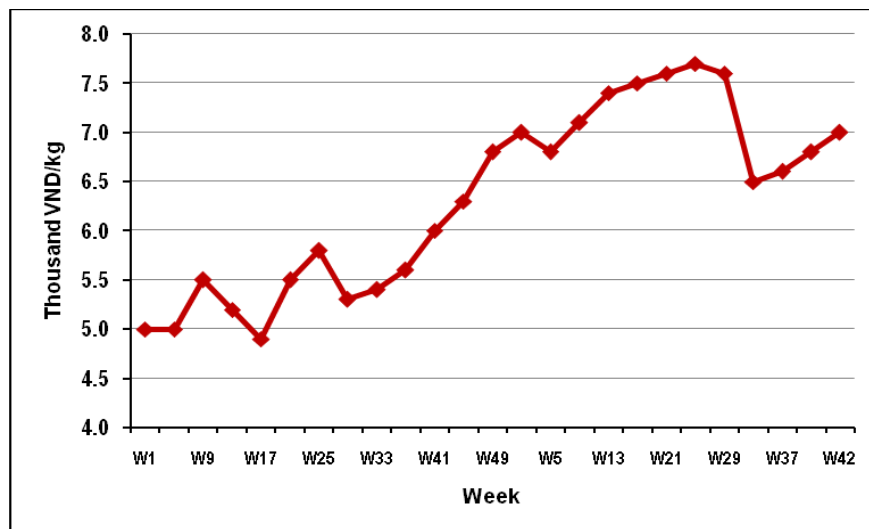


Figure 6.6. Purchasing price of whole-grain maize charged by feed enterprises by week in 2010 and 2011

Source: Agromonitor (2012)

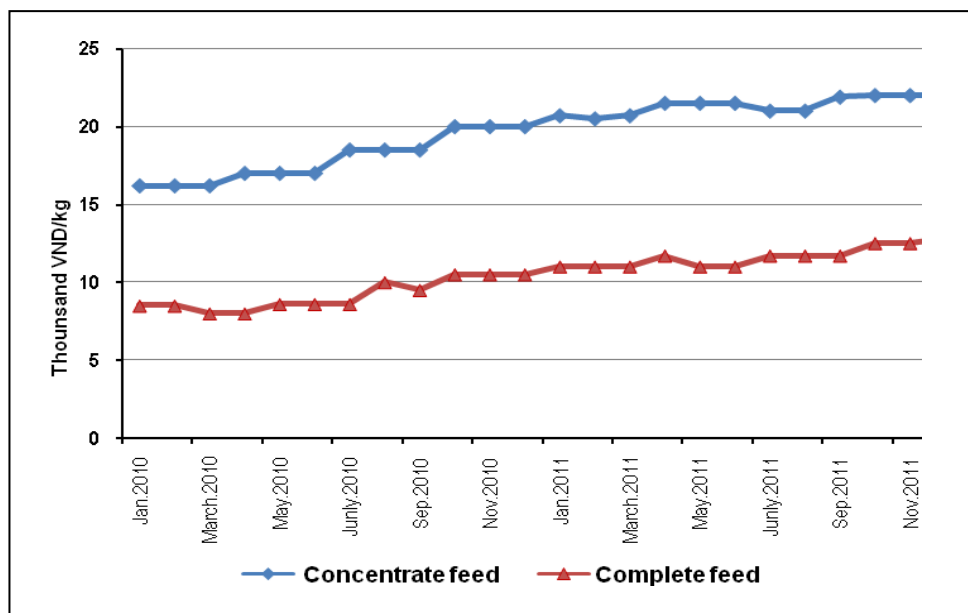


Figure 6.7. Selling price of pig feed (Cargill brand) in 2010 and 2011

Source: Feed sellers in Dan Chu commune, 2010 and 2011

The average selling price of pig feed of the Cargill brand for each month of the year 2010 and 2011, collected from feed retailers in Dan Chu commune, is taken as an example of the increasing trend in feed prices. As presented in Figure 6.7, the feed price increased rapidly in 2010 and 2011. The pig feed price and chicken feed price increased by 37.5% and 41% in the period from January 2010 to December 2011.

Findings from the survey showed that most of the farmers in both the animal-based group and the non animal-based group purchased a small volume of feed from retailers in the village. 65% of households in the animal-based group and 100% of households in the non animal-based group purchased industrial feed from retailers in the village. Only 25% of households in the animal-based group purchased feed directly from small feed factories. Many farmers usually purchased a small volume of feed each time because they did not have the cash to purchase a high feed volume. To purchase a small feed volume from feed retailers, farmers had to spend a higher amount of money due to higher price. Most of them indicated that credit used for feed purchasing would reduce the feed price. The non-credit constrained households in the animal-based group normally purchase feed directly from small factories. Three or four households purchase a large volume of feed together. They also receive a commission from the factory. In brief, it can be concluded that purchasing a small amount of feed per time from the retailer in the village leads to higher feed costs. In addition, the dependence on imported raw materials for industrial feed processing also caused a substantial rapid increase in feed prices.

6.3.3. Lack of guidance for feed selection

The total number of registered feed mills in Vietnam in 2008 was 225, which consisted of 42 foreign, 12 joint ventures and 171 domestic ones. The Red River Delta and the southeast region were the two biggest feed producing areas, accounting for 46% and 29% of the total national feed mills respectively (Phuong et al. 2010). Currently, in Hai Duong Province, various types of feeds of difference prices are sold on the village market. The data in Table 6.5 was gathered from a feed retailer to provide differences in price of some feed brands. The price of pig concentrate feed varied from 15,900 to 18,7000 per kg. The price of complete pig feed also differed from one brand to another. Farmers also reported that many feed brands were available in the local market. The private companies were the dominant suppliers of animal nutrition advice. An advertisement for a good feed quality was widely provided by every feed producer. However, in Hai Duong Province, the government extension services provided a full range of crop management and animal husbandry advice that was heavily oriented towards intensification of production. Extension workers did not provide animal producers with non-technical information on production and marketing, including feed selection advice. It was difficult for producers to select what brand of feed to purchase.

Table 6.5. Differences in average price of some brands of pig feeds in 2010

Unit: 1,000sVND per kg

Companies	Feed brands	Concentrate	Complete
Cargill Vietnam	Cargill	18.7	9.5
CP Vietnam Corporation	CP	17.3	8.6
VIC Company	Golden Pig	17.5	11.3
De Heus Vietnam	De Heus	18.2	10.5
Vasafeed Corporation	Inter	16.4	7.9
Dabaco Vietnam	Nasaco	17.6	8.9
Proconco Vietnam	Procy	16.8	9.7
Japfa Comfeed Vietnam	Japfa	15.9	8.5

Source: Feed retailer in Dan Chu commune, 2011

The data in Table 6.6 provides information on farmer industrial feed selection. Most of the farmers in the animal-based group used both personal experience and advice from feed retailers to select a brand of feed. In addition, about 53% of farmers in the non animal-based group applied the advice of feed retailers in the village for their feed selection. No one received advice for industrial feed selection from an extension worker. Findings on the current situation suggest that government extension services should provide animal producers with information to help them with feed selection.

Table 6.6. Farmer decisions on industrial feed

Unit: Percentage

Sources	Animal-based group	Non animal - based group
Advice from extension officers	0	0
Personal experience	33	10
Advice from village feed retailers	16	53
Personal experience and advice from feed retailers	46	25
Personal experience and experience of neighbors	5	12
Total	100	100

Source: Household survey, 2011

6.3.4. Credit access constraints

The findings outlined in Chapter 5 show that the surveyed households still faced credit access constraints due to such reasons as a lack of physical collateral, limited access to information on credit programs and the weakness of the formal sector's credit supply in the agricultural sector. Both the animal-based group and the non animal-based group desired to receive loans from the banks for their production. VBSP mainly provided credit for education. Therefore, credit provided by VBARD and PCFs were important for animal production. The government stated that in collaboration with political and economic mass organizations, VBARD was responsible for supplying small loans without a physical collateral requirement. Practically, it did operate efficiently. Many farmers still had limited access to information on such a credit program. In addition, PCFs, a commercial credit provider, definitely supplies credit with the physical collateral requirement. Consequently, many farmers without physical collateral did not have access to credit from VBARD nor from PCFs. In Hai Duong Province, the credit supply of the formal sector did not meet the credit needs of animal producers. It was also found that the higher credit needs of farmers were more rationed by VBARD and PCFs. It revealed that a large demand for credit exists in Hai Duong Province. The weaknesses in rural lending of the formal sector resulted in some credit access constraints for animal producers.

6.3.5. High volatility of output prices

The surveyed farmers indicated that market price fluctuation was one of the highest risks leading to major loss of income. Pig prices varied strongly due to both the supply and demand of pork, influenced by disease outbreak and input prices. From data collection in the field survey, it was shown that in 2010, the average price of chicken was 60,000 VND per kg. However, the variation in price was very large. The lowest price was 50,000 VND per kg, whereas the highest price was 69,000 VND per kg. The average price of a live pig was about 41,000 VND per kg. The variation in price also was very large. The lowest price was 32,000 VND per kg meanwhile the highest price was 60,000 VND per kg. From March 2010

to June 2010, the price of a live pig fell due to an outbreak of PPRS. Disease outbreaks have strong negative effects on pig producers. Losses came not only from sick pigs, but also due to decreased prices due to *consumer* concerns about pork quality. After the disease outbreak (1-2 months), it takes at least one cycle for a pig farmer to recover his initial situation. High prices and the unknown quality of piglets after disease outbreaks were also a problem. In late 2010, the price of a live pig went up due to the shortage of supply. The price of a live pig continuously increased in the first six months of 2011, then dropped and increased again in late 2011. In 2011, the average price of a live pig was about 56,400 VND per kg because of disease outbreak consequences in 2010. While pig prices did not show a strong increasing pattern, animal feed price increased continuously by about 40% during 2008–2010 (Thao et al. 2010). As can be seen in Figure 6.8, the price of chicken also fluctuated similarly in 2010 and 2011.

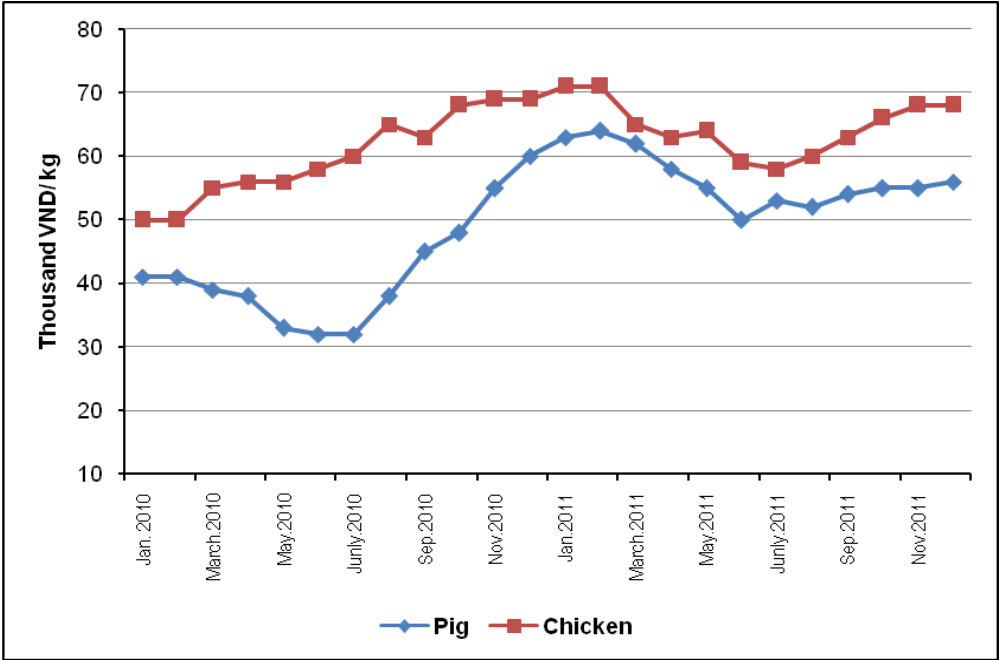


Figure 6.8. Price volatility of live pigs and chickens

Source: Livestock collectors in Dan Chu commune, 2011 and 2012

During the survey work, village livestock traders also were asked to provide their opinions about reasons relating to the fluctuation of livestock prices. They reported that price fluctuation was not only affected by livestock disease but also by livestock smuggling. It was confirmed by chairman of the Vietnam Poultry Association that supervision of illegal imports across the border remains weak. The official added that around 100 million chickens are imported into Vietnam each year. Every day, hundreds of trucks bring chicken products of unclear origin into Vietnam. Many of the chickens and chicken products leave their destinations in China with the label “Mía,” a high-quality chicken sold at around 130,000 VND per kg. The labels are changed, however, when they reach the market in Vietnam, to “Local Breed” which is supposed to be raised in Vietnamese rural areas and is

considered good quality. In Vietnam, sales of low quality Chinese chicken remains uncontrolled, posing a threat to the domestic poultry husbandry industry (DTin News 2012) .

Box 6.1. Smuggled chickens from China—a main cause of sudden reduction in chicken price

Mr. Hung is a chicken collector in Cam Hoang commune. Every day, he collects chickens from his village for forwarding to the city of Hai Duong. He reported that the price of chicken suddenly fell with the increasing volume of chickens smuggled onto the market. For example, the price of chicken suddenly dropped from 60,000 VND per kg to 55,000 VND per kg in just three days. He also reported that the sharp drop in the price of chicken not only caused difficulties in his business but also greatly reduced the income of his neighbors and farmers in his village who raised chickens. In his point of view, the government should strictly eliminate the smuggling of chickens to protect chicken producers as well as local collectors.

Source: Livestock collector in Cam Hoang, 2011

6.3.6. Limited access to relevant market information

The lack of an organized livestock marketplace infrastructure means that farmers usually deal with buyers on an individual basis (Nin et al. 2003). On the study site, it was found that traders living in or outside the village generally provided market information to small farmers. The government information network is not organized in a systematic manner with overlaps between and across various government agencies. Therefore, government institutions are not in a position to supply information that farmers can use in their marketing activities. In addition, market information was not available in a timely manner. With limited access to relevant market information, many surveyed farmers did not know where and to whom best to sell their animal outputs and so be able to obtain a fair price. Given this, farmers were less geared to raise animals targeted to a specific market where they could expect to obtain a fair economic return (Lapar et al. 2003). Supporting this study finding, Binh et al. (2007) also indicated that small livestock producers had limited access to market information. It was difficult for them to plan their production scale in a way that was truly commensurate with consumer demands.

Table 6.7. Sources of output market information

Unit: Percentage

Sources	Animal-based group	Non animal-based group
Government extension institutions	0	0
Television	86	75
Output collectors	100	100
Feed retailers in the village	72	85
Staff of feed companies	23	0.0
Neighboring animal producers	70	100

Source: Household survey, 2011

The surveyed farmers gathered output marketing information from various sources. Market information from output collectors, television and input dealers in the village and neighboring animal producers became a main information source for both the animal-based group and the non animal-based group. About 23% of the animal-based group also gathered market information directly from feed company sales staff. Most farmers reported that market information from television also was not adequate in terms of forecasting. All farmers indicated that they did not receive any market information from the government extension institutions. It should be highlighted that the surveyed farmers could access market information from various sources. However, in reality, the information overlapped and was not consistent (Figure 6.9). Consequently, farmers had limited access to relevant market information.

Box 6.2. Just guessing output price trends by using of information on feed volume consumption

Mr. Hung lives in Dan Chu commune and engages in pig production as a main income activity. He reported that in his search for information on output prices he usually watched the news on television. However, it was not enough for him to decide how many pigs he should produce during the year or select a favorable time for selling his pigs. He shared his experience in searching output market information. He usually asked for information on feed consumption of feed company sales staff. As the consumed volume of feed was low, it likely revealed that a low number of pigs were being raised. As a result, the price of pigs could be on an uptrend due to a low supply of pork. He therefore tried to keep his mature fattened pigs for some more weeks in expectation of selling his pigs at a favorable price.

Source: In-depth interview with farmer, 2011

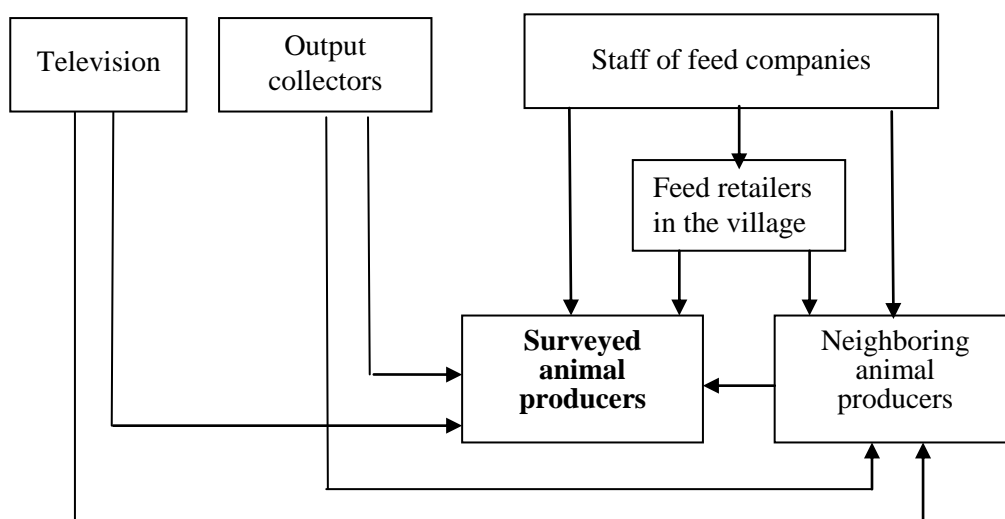


Figure 6.9. Overlap in market information, but limited access to relevant market information

Source: Household survey, 2011

6.3.7. Weak bargaining power of individual animal producers

Experience worldwide shows that small farmers have much to gain by collaborating through associations or production groups. Joining forces in obtaining farm inputs, selling products, negotiating credit, and even creating mutually owned companies that operate within the value chain can greatly help farmers. This type of cooperation increases the farmer's bargaining position with traders and financiers, helps them access and develop technology, and has huge scale advantages through the bulking of inputs and outputs. Processors and traders also prefer to work with farmer groups rather than farmers individually. For farmer groups, not only do economies of scale play a key role, but processors and traders may also be more reliable partners than individual farmers, as individuals may not have a clear concept of what it means to sign a contract. Member farmers may not fully understand their obligations in the contract, and concepts like quality and certification may be new to them. But representatives of the group of farmers can help them interface with the traders and processors (Jessop et al. 2012).

Without timely information as a basis for marketing decisions, the surveyed farmers usually were at the losing end in the bargaining process vis-à-vis traders and other agents who have more information due to their exposure to a wider geographic area and a larger number of market players. It was found that 100% of the surveyed farmers individually sold their pigs, poultry and fish to collectors at the farm gate. In addition, 78% of the surveyed farmers reported that they were not satisfied with their selling price. All of them indicated that they had no choice in the selection of buyers. As a result, they had to sell their animal products at a lower price than the price they hoped to get. This reveals that the surveyed households who were small-scale animal producers had but low bargaining power during the process of selling their products. As demonstrated in Figure 6.10, it was found that lack of linkage among animal producers in both production and marketing was the main reason for the low bargaining power of the individual animal producer. The surveyed households reported that they did not understand clearly the advantage of farmer group linkage. In addition, they had never received suggestions from agricultural business experts. The local extension institution did not appear to shown any intention of supporting linkage establishment in production and marketing.

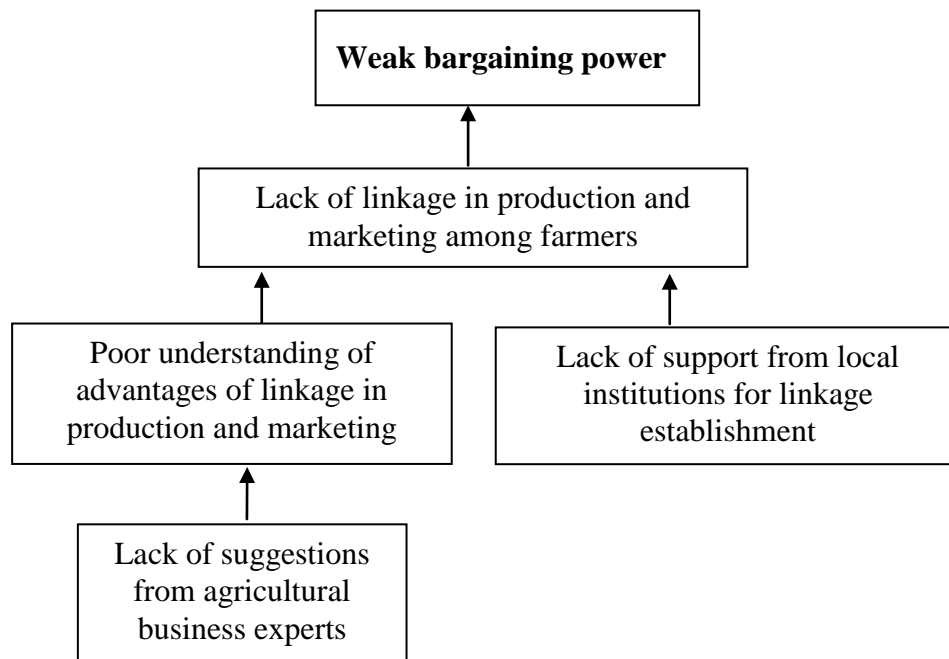


Figure 6.10. Reasons for weak bargaining power of individual animal producers

Source: Household survey and group discussion, 2011

6.3.8. Ranking of constraints to animal production and marketing

Some main constraints to animal production and marketing were detected from the group discussion. Then, during the household survey, each surveyed household was asked whether it really faced each constraint or not. Finally, the constraint ranking was done separately for the animal-based group and the non animal-based group, which was based on the percentage of responses from the surveyed households. The result of the constraint ranking was presented in Table 6.8.

There were small differences in the percentage of responses between the two groups. The ranking position of the credit access constraints and the ranking position of the high volatility of output prices and other constraints came up with the position in the ranking. Generally, the ranking position seemed to reflect the negative influence of each constraint on animal production in recent years, not only in the year 2010.

Table 6.8. Ranking of constraints

Constraints	Animal-based group		Non animal-based group	
	Percentage ¹ (%)	Ranking position	Percentage ¹ (%)	Ranking position
Credit access constraints	55	3	82	2
Animal disease	53	4	64	4
Substantial rapid increase in feed price	100	1	100	1
Lack of guidance for feed selection	31	7	40	7
High volatility of output prices	67	2	70	3
Limited of access to relevant market information	47	6	51	6
Weak bargaining power	51	5	60	5

Source: Household survey, 2011

Note:¹ Number of surveyed households who responded that they actually faced each constraint, divided by the number of surveyed households in each group, yielded the percentage in Table 6.8.

It was found that the substantial rapid increase in feed price was a major problem faced by both groups, because feed expenditure accounted for a main production cost. As a consequence, the substantial rapid increase in feed prices led to increased production costs and cut back on income from animal production. Credit access constraints were ranked as the second problem for the non animal-based group and as the third problem for the animal-based group. As shown in the detailed discussion in Chapter 5, credit access constraints occurred for both groups and resulted in a lack of cash for investment in animal production. In addition, the high volatility of output prices also caused a high variation in income of both groups. The farmers reported that the high volatility of output prices also made animal production uncertain, which made it difficult to make plans for production as well as impeded their investment in animal production. Next, animal disease was ranked as the fourth constraint. The farmers entirely accepted the fact that animal disease caused a risk in animal production or losses of farmer income. The third problem was weak bargaining power. As for weak bargaining power, both groups sold their animal products at lower price compared to their expected price. Thus, weak bargaining power also negatively influenced farmer incomes. Next, limited access to market information was accepted as the third problem having a negative consequence on animal production in both the income of the certain year and planning for production in some recent years. Finally, lack of guidance for feed selection made it difficult for farmers to make a selection regarding their industrial feed purchases. As a result, it was listed as the seventh constraint. The direct negative influence on animal production and income associated with constraints are briefly presented in Table 6.9.

Table 6.9. Constraints to animal production and their direct negative influence on animal production

Constraints	Direct negative influences
Animal disease	- Losses in animal production - Reduction in income - Difficulties in product selling
Substantial rapid increase in feed price	- Reduction of income
Lack of guidance for feed selection	- Difficult to make a selection of industrial feed purchases
Credit access constraints	- Low input investment - Reduction of income - Small production scale
High volatility of output prices	- Difficult to make plans for production
Limited access to relevant market information	- Difficult to make plans for production
Weak bargaining power	- Low selling price - Reduction of income

Source: Household survey, 2011

6.4. Income of animal producing households

The income of the surveyed households was analyzed and compared between the animal-based group and the non-animal based group, and among subgroups with differences of credit accessibility. As mentioned in Chapter 5, the non-credit constrained group included households who were approved for the full required loan amount by VBARD and PCFs. In contrast, in the credit constrained group, households were approved for a part of a required loan amount or had their loan application rejected or had a need for credit but did not apply for loans. In the light of this situation, a classification of subgroups was done and is presented in Figure 6.11.

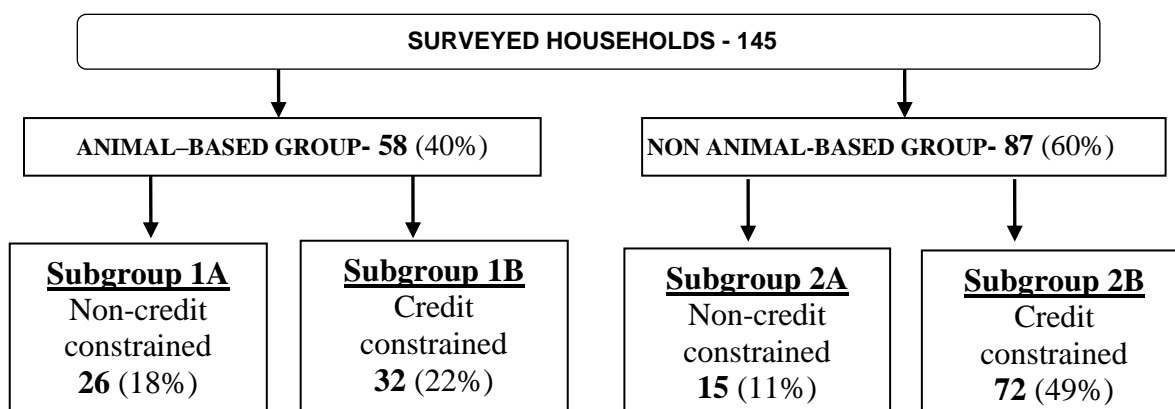


Figure 6.11. Classification of subgroups

Source: Household survey, 2011

6.4.1. Crop production

The surveyed households cultivated rice, vegetables and some cash crops (watermelon, chili, beans and peanuts). Rice production mainly served for household consumption and partly provided products to market. Rice production generated a low income. However, it enabled farmers to have food security. On the study site, cash crop production was also limited due to volatility of selling prices and reduced areas of arable land.

Table 6.10. Income from crop production

Unit: mil.VND

Sources	Total		Animal-based group		Non animal-based group		P values
	Mean	S.D.	Mean	S.D.	Mean	S.D.	
Rice	13.1	5.6	11.7	4.7	14.0	6.0	0.01***
Other crops	2.2	1.4	2.7	1.6	1.8	1.3	0.00***
Total	15.3	5.8	14.4	4.8	15.8	6.4	0.14*

Source: Household survey, 2011

Note: *** and * are significant levels at 1% and 10%, respectively.

As can be seen in Table 6.10, crop production generated a similar level of income for both groups. The rice production income of the animal-based group and the non animal-based group were 11.7 mil.VND and 14.0 mil.VND, respectively. Given their similar area of land, both groups attained a similar level of income from crop production. This revealed that crop production plays a similar important role in income generation for both groups. Rice production income was higher compared to income from other crops.

6.4.2. Non-farm activities

With its high population density and limited land availability, the Red River Delta region, including Hai Duong Province, has seen a transformation of its rural economic unit from subsistence farming to intensive, high-value food production for local and urban markets, and non-farm employment. Although farming is still the primary activity for more than half of the population on the study site, most households now combine intensive farming with non-farm activities. Rural families often allocate their labor assets in order to reduce risk and increase their incomes. Some members continue to intensify their work in the countryside, while others seek earnings nearby or in distant locations as seasonal migrant workers. Non-farm activities in which surveyed farmers engaged consisted of casual wage labors and laborers hired on regular contract, running a small business and other activities (Figure 6.12).

Like many provinces in the Red River Delta, Hai Duong Province has embarked on an ambitious industrialization program aimed at attracting both foreign and domestic manufacturers through the establishment of industrial zones and tax incentives. Job opportunities within the province have increased recently, with the newly established Hai Duong industrial zone nearby. A small number of young workers in Hai Duong Province have joined the factories (e.g. garment, leather shoes, electronics and food processing factories) located there. Those factories normally recruit young workers who are from 18 to 35 years old. Therefore, farmers who are over 35 years old cannot easily find employment in them. However, an increased demand for local labor is not expected for some years to come, or until the industrial zone develops fully. It was found that 15% of the surveyed households had a family member who was as a wage-earning laborer in a factory. Households with a wage-earning laborer accounted for 19% in the non animal-based group while the proportion was 7% in the animal-based group.

Regarding to workers paid by the day, the increasing demand from construction resulted in an increasing demand for masons (*thợ xây*), carpenters (*phụ hồ*), and woodcarvers (*môc*) in the villages and districts of Hai Duong Province and the surrounding areas of Hung Yen, Hai Phong, Bac Ninh Provinces and Hanoi. A good road and transport network also allows farmers to seek employment in local urban centers or in Hanoi without the need to leave their home villages permanently. Farmers indicated that they preferred to work in places which were close to their home, such as in nearby villages, districts or towns, and were willing to accept lower wages than they could earn in Hanoi or other cities because the cost of living locally is cheaper than in big cities. The proportion of household members working as daily paid workers was 71% for the animal-based group and 79% for the non animal-based group. This implies that most surveyed households had a higher frequency of a member being a daily paid worker than having a job in other trades where opportunities were lower due to age and skills requirements. In other words, daily paid work became an essential non-farm activity for the

surveyed households. However, daily paid work was unregistered employment, leading to unstable job opportunities.

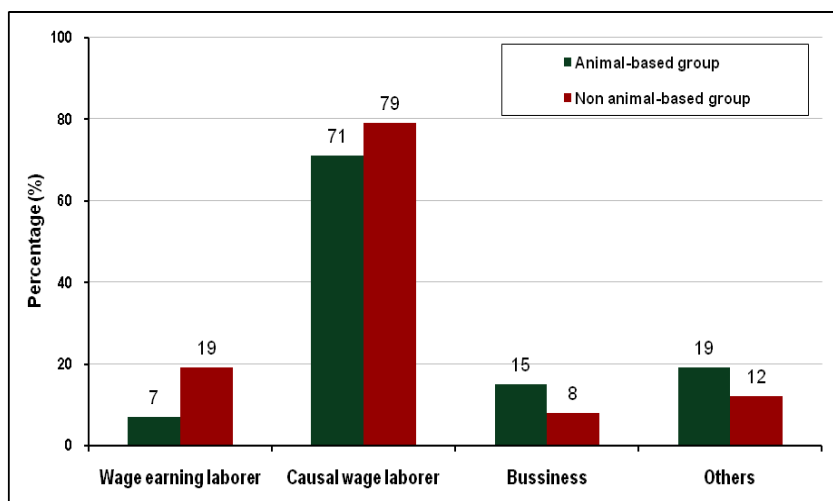


Figure 6.12. Involvement in non-farm activities by surveyed households

Source: Household survey, 2011

Note: Each household was engaged in one or more non-farm activities. Therefore, total percentages were different from 100%.

With regard to small businesses, 15% of households in the animal-based group and 8% of households in the animal-based group run small businesses. This involves either running a business in a small shop to supply daily goods for other households in the village or working as collectors of agricultural products in local markets. Finally, the other non-farm activities include food processing for local markets, small transport (*công nông*), mechanized rice-separation services (“*máy phứt*”), and milling services (“*máy phay*”). And 19% and 13% of households in the animal-based group and the non-animal based group engaged in the abovementioned activities. Income from non-farm activities is presented in Table 6.11.

In brief, the involvement of farmers in non-farm activities commonly occurs in the rural areas of Hai Duong Province nowadays. It contributes to increased income for farmers. However, it bears repeating that the surveyed households with member(s) performing unskilled labor generally received a relatively unstable income from non-farm activities.

Table 6.11. Income from non-farm activities

Unit: mil.VND per household

Activities	Total	Animal-based group	Non animal-based group
Wage earning laborer	4.2	1.3	6.0
Causal wage laborer	13.2	8.6	16.2
Small business	3.3	4.5	2.4
Other	2.0	2.5	1.4
Average	22.7	16.9	26.0

Source: Household survey, 2011

6.4.3. Animal production

As shown further in Table 6.12, income from animal production was 58.7 mil.VND for the animal-based group and 13 mil.VND for the non animal-based group. P values indicate that incomes from animal production in both groups were significantly different. The income from animal production of the animal-based group was 4.5 times higher than that of the non animal group, because the animal-based group mainly allocated its financial capital and labor to animal production. The variation in income in the animal-based group was relatively high (28 mil.VND). Specifically, both groups earned a higher amount of money from fish and pig production than poultry because only a small number of them raised poultry. Ten years ago, it was found that in the surveyed commune many farmers converted part of their rice land to fish production. As a result, fish production plays an important role in their income generation, especially for the animal-based group.

Table 6.12. Income from animal production

Unit: mil.VND

Sources	Total		Animal-based group		Non animal-based group		P values
	Mean	S.D.	Mean	S.D.	Mean	S.D.	
Poultry	5.7	4.1	7.7	4.9	4.3	2.8	0.00***
Piglets and fatling pigs	14.4	12.3	25.0	16.5	6.2	3.7	0.00***
Fish ⁽¹⁾	20.5	18.0	26.3	18.2	8.0	7.0	0.00***
Total ⁽²⁾	31.3	29.4	58.7	28.5	13.0	8.9	0.00***

Source: Household survey, 2011

Note: *** significant level at 1%; ⁽¹⁾ ⁽²⁾ Number of surveyed households, number of households in the animal-based group and number of households in the non animal-based group was 145, 58 and 87, in turn, while the number of households that engaged in pig production was 84, 57 and 27 for the surveyed households, the animal-based group and the non animal-based, respectively. To present an exact comparison, the average income from fish production was calculated based on the number of households engaged in fish production. Therefore, total income in Table 6.12 is not equal to total income from each source. Using of number of surveyed households, number of households in the animal-based group and number of households in the non animal-based group for calculation, mean and standard deviation of fish production of surveyed households, the animal-based group and the non animal-based group was 11.0(16.9), 26.3(18.3) and 2.5(6.2) mil.VND, respectively.

With respect to the income distribution from animal production, it was different between the animal-based group and the non animal-based group. Within the non-animal based group, 83% of households generated less than 20 mil.VND and 17% of households made 21mil.VND to 50 mil.VND from animal production. Within the animal-based group, 43% of households received less than 50 mil.VND, 36% of households obtained 51 mil.VND to 70 mil.VND and 21% of households made 81mil. VND to153 mil.VND from animal production.

Regarding animal production income among the subgroups, subgroup 1A had the highest income, followed by subgroup 1B, subgroup 2A and subgroup 2B. P values and the Ducan test confirmed that among the subgroups, total income from animal production was significantly different. Income from animal production of subgroup 1A (75.5 mil.VND) was 1.5 times higher than that of subgroup 1B (45 mil.VND). Similarly, the income of subgroup 2A (24.3 mil.VND) was twice as high as that of subgroup 2B (10.8 mil.VND). This indicates that among the surveyed households, non-credit constrained households had a substantially higher income from animal production because the non-credit constrained households had more available cash, which was mobilized from all sources, to operate large-scale animal production, than the credit constrained households. The difference in income from poultry production was small among the four subgroups. This can be explained by the fact that the number of households raising poultry in each group differed little. It should be noted that the non-credit constrained households had a higher income from fish and pig production compared to those of the credit constrained households because production of fish and pigs entails high capital expenditure. With limited financial capital, the credit constrained households were unable to invest a high amount of money in animal production.

Table 6.13. Income from animal production by subgroups
Unit: mil.VND

Sources	Animal-based group		Non animal-based group		P values
	<u>Subgroup 1A</u>	<u>Subgroup 1B</u>	<u>Subgroup 1A</u>	<u>Subgroup 1B</u>	
	Non-credit constrained	Credit constrained	Non-credit constrained	Credit constrained	
Poultry	10.4 ^a (5.1)	5.6 ^{bc} (3.4)	6.6 ^b (4.7)	3.8 ^c (1.9)	0.00 ^{***}
Piglets and fatling pigs	31.6 ^a (18.7)	19.7 ^b (12.4)	8.7 ^c (3.7)	5.7 ^d (3.9)	0.00 ^{***}
Fish ⁽¹⁾	34.9 ^a (21.6)	19.7 ^b (11.6)	18.6 ^b (12)	4.6 ^c (3.3)	0.00 ^{***}
Total ⁽²⁾	75.5 ^a (30.5)	45.0 ^b (17.7)	24.3 ^c (12.4)	10.8 ^d (6.0)	0.00 ^{***}

Source: Household survey, 2011

Note: The value in the rows of each source is the mean and standard deviation, respectively; *** significant at 1%; ^{abcd} means in the same row without common letter are different at P< 5% by Ducan test; ^{(1) (2)} number of households in each subgroup was 26, 32, 15 and 72, in turn, while the number of households engaged in pig production in subgroups 1A, 1B, 2A and 2B is 25, 32, 7 and 20, respectively. To present an exact comparison, average income from fish production was calculated based on the number of households engaged in fish production. Therefore, total income in Table 6.13 was not equal to total income from each source. Using the number of households of each subgroup for calculation, mean and standard deviation of fish production of the subgroup 1A, 1B, 2A and 2B was 33.5 (22), 19.7 (11.6), 9.0 (12.5) and 1.3 (2.6) mil.VND, respectively.

Table 6.14 shows income from various sources for the surveyed household in 2010. Generally, income from non-farm activities and animal production was relatively different between the animal based group and the non animal-based group, while income from crop production was similar. The non animal-based group had relatively higher non-farm income than the animal-based group. In contrast, the animal-based group generated considerably higher income from animal production than the non animal-based group. As a result, the total income of the animal-based group (90 mil.VND) was much higher than that of the non animal-based group (54.8 mil.VND). P values confirmed that the total income and monthly income per capita of both groups were significantly different. It indicates that animal production plays a crucial role in income generation for farm households on the study site, especially for farmers with low income from crop and non-farm activities. It also suggests that the proper expansion of animal production would create an important income source for farmers. However, among households in the animal-based group, there was a large income disparity, reflected by the standard variation (34.8 mil.VND).

Regarding monthly income per capita, this indicator more exactly reflects the income difference between two groups. The monthly income per capita was 1.68 mil.VND for the animal-based group and 1.02 mil.VND for the non-animal based group. Compared to the non animal-based group, the higher income partly reflects its higher living standard. However, the standard deviation of monthly income per capita of the animal-based group was 0.6, relatively higher compared to 0.3 of the non animal-based group. It reveals that the variation in monthly income per capita among households in the animal-based households was higher than the non animal-based groups.

Table 6.14. Income of animal producing households from various sources

	Total		Animal-based group		Non animal-based group		P values
	Mean	S.D.	Mean	S.D.	Mean	SD	
Crop (mil.VND)	15.1	5.8	14.4	4.8	15.8	6.4	0.14*
Animal (mil.VND)	31.3	29.4	58.7	28.5	13.0	8.9	0.00***
Non-farm activities (mil.VND)	22.7	13.9	16.9	11.6	26.0	14.0	0.00***
Total income (mil.VND)	69.1	32.6	90.0	34.86	54.8	21.2	0.00***
Monthly income per capita (mil.VND/capita)	1.29	0.6	1.68	0.7	1.02	0.3	0.00***

Source: Household survey, 2011

Note: *** and * significant levels at 1% and 10%, respectively.

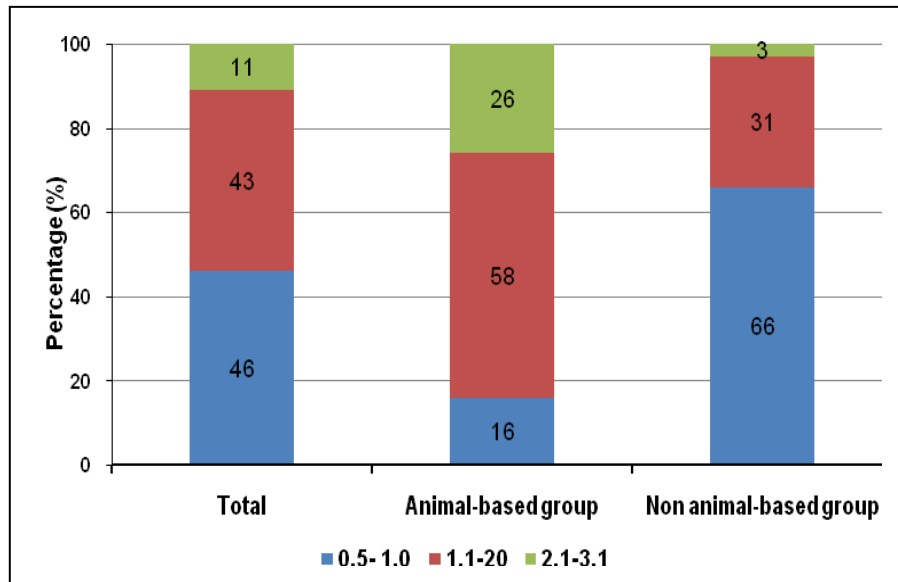


Figure 6.13. Distribution of monthly income per capita

Source: Survey household, 2011

The distribution of monthly income per capita of surveyed households is illustrated in Figure 6.13. It is easily realized that monthly income per capita ranged from 500,000 VND to 3,100,000 VND. The number of households who had 500,000 VND to 1,000,000 VND per month per capita occupied a main proportion (46%) while the number of households who made 2,100,000 VND to 3,100,000 VND per month per capita accounted for a small part (11%). In other words, among the surveyed households there was a large gap between the number of households with low income and the number of households with high income. According to the data from the Hai Duong Statistics Office (HDSO 2011), monthly income per capita for household in Hai Duong Province in 2010 was 1,300,000 VND. It reveals that about 50% of the surveyed households had the monthly income per capita was lower than the average monthly income of households in Hai Duong Province. It can be concluded that as a whole the income from animal producing households on the study sites was still low compared to other households in the same province.

In terms of income structure, there was a considerable difference of share of income between the two groups. The most important income source of the non animal-based group was crop production, followed by non-farm activities and animal production. The income of the animal-based group was mainly generated from animal production, followed by crop production and non-farm activities. The non animal-based group generated its income mainly from crop production (48%), while the animal-based group attained 64% of total income from animal production (Figure 6.14).

With a heavy dependence on crop production, the non animal-based group consequently earned a lower income than the animal-based group. Concerning non-farm activities, the share of income from non-farm activities was 31% for the non animal- based group and 17% for the animal-based group. It indicates the important role of non-farm activities in income generation for the non-animal based group. However, it should be emphasized that most of the farmers in the non animal-based group were unskilled workers available for good non-farm jobs. Thus, it was quite difficult for farmers in the non animal-based group to find stable jobs with a relatively high income. The expansion of animal production is expected to increase income for the non animal-based group. The share of income from crop production, animal production and non-farm income of all surveyed households in total income was 36%, 38% and 26%, respectively. These figures confirm that animal production contributes a considerable proportion to the total income of farmer households on the study sites.

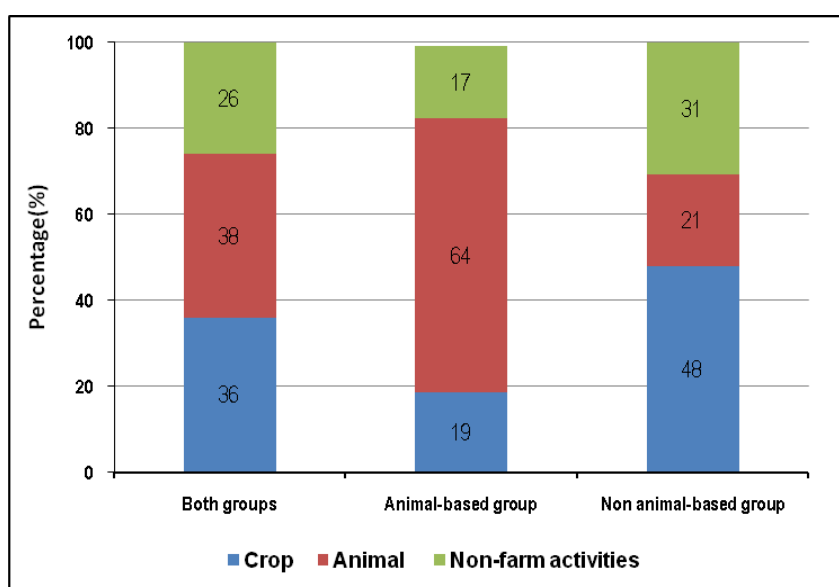


Figure 6.14. Share of income from each source by group

Source: Household survey, 2011

Table 6.15 provides information on the income of the subgroups from various sources. Within the animal-based group, income from each source was considerably different between subgroup 1A and 1B, especially income from animal production. Animal production created 75.5 mil.VND for subgroup 1A and 44.9 mil.VND for subgroup 1B. The non-farm income of subgroup 1A (19.4 mil.VND) was slightly higher than that of subgroup 1B (14.4 mil.VND). Both groups had a similar income from crop production. In 2010, the total income of subgroup 1A was 108.8 mil.VND, which was relatively higher than that of subgroup 1B (74.1 mil.VND). Regarding to the non animal-based group, the income gap from various activities between subgroups 2A and 2B was similar to that between subgroups 1A and 1B. Among the 4 subgroups, monthly income per capita of subgroup 1A was the highest (2.07 mil.VND), followed by subgroup 2A (1.51 mil.VND), subgroup 1B (1.36 mil.VND) and subgroup 2B (0.92 mil.VND). In other words, subgroups 1A and 2A that were non-credit

constrained households had a higher monthly income per capita than subgroups 1B and 2B, which were credit constrained households. P values and the Duncan test confirm that among the subgroups, total income and monthly income per capita were significantly different. This implies that better credit access, i.e. a reduction of credit access constraints, could increase income for animal producing households. In addition, it was found that of 145 surveyed households, the number of households in subgroups 1A and 2A accounted for 18% and 11% respectively, while the number of households in subgroups 1B and 2B represented 22% and 49%, respectively. This reflects that the number of households who had a low income occupied a high share of the total number of surveyed households. This situation requires economic solutions to increase the income of many animal producers on the study sites, especially subgroups 1B and 2B. Given their limited human, physical and financial capital, it was realized that subgroup 2B could increase its income by improving animal production rather than looking for new non-farm activities.

Table 6.15. Income from various sources by subgroup

	Animal-based group		Non animal-based group		P values
	Subgroup 1A	Subgroup 1B	Subgroup 2A	Subgroup 2B	
	Non-credit constrained	Credit constrained	Non-credit constrained	Credit constrained	
Crop (mil. VND)	13.9 ^a (4.9)	14.8 ^a (4.8)	22.2 ^b (8.6)	14.5 ^a (4.9)	0.00 ^{***}
Animal (mil. VND)	75.5 ^a (30.5)	44.9 ^b (17.7)	24.3 ^c (12.4)	10.8 ^d (6.0)	0.00 ^{***}
Non-farm (mil. VND)	19.4 ^{ab} (13.4)	14.4 ^b (9.5)	32.9 ^c (18.7)	25.2 ^a (12.6)	0.00 ^{***}
Total income (mil. VND)	108.8 ^a (36.3)	74.1 ^b (24.4)	79.4 ^b (20.8)	50.5 ^c (16.9)	0.00 ^{***}
Monthly income per capita (mil. VND/capita)	2.07 ^a (0.7)	1.36 ^b (0.5)	1.51 ^b (0.5)	0.92 ^c (0.3)	0.00 ^{***}

Source: Household survey, 2011.

Note: Value in rows of each source is mean and standard deviation, respectively; *** significant level at 1%; ^{abc} means in the same row without common letter are different at P < 5% by Duncan test.

Table 6.16. Comparison of monthly income per capita in 2010 between surveyed animal producing households and some representative groups

Household groups	Monthly income per capita (mil.VND)
Whole country of Vietnam	1.38
Urban regions of Vietnam	2.13
Rural regions of Vietnam	1.07
Red River Delta region	1.58
Hai Duong Province	1.30
Surveyed households	1.29
Animal-based group	1.68
<i>Subgroup 1 A (non-credit constrained)</i>	2.07
<i>Subgroup 1B (credit constrained)</i>	1.36
Non animal-based group	1.02
<i>Subgroup 2 A (non-credit constrained)</i>	1.51
<i>Subgroup 2B (credit constrained)</i>	0.92

Source: GSO, 2011 and Household survey, 2011

Referring to income comparison between the surveyed households and some representative groups, the data in Table 6.16 was collected from the survey results using Vietnam household living standards in 2010 (GSO 2011) and the survey results of the study for a comparison analysis. It was shown that the monthly income of surveyed households (1.29 mil.VND) was slightly higher than that of rural households in Vietnam (1.07 mil.VND). It is noteworthy that currently in many other provinces of Vietnam, especially households living in the mountainous and central regions of Vietnam (Son La, Cao Bang, Lao Cai, etc.), farmers have lower access to information, education, markets and other public services and suffer from adverse weather conditions. Consequently, the farm households living in such remote regions generated lower income than the households surveyed in Hai Duong Province. However, compared to the monthly income of urban households in Vietnam (2.13 mil.VND), the monthly income of the surveyed households (1.29 mil.VND) was much lower. It should be highlighted that the monthly income of the non animal-based group (1.02 mil.VND) is much lower overall than that of households in Vietnam, urban households in Vietnam, households in the Red River Delta and households in Hai Duong Province. The existence of such a large income gap between the surveyed households and some representative household groups indicates that an increase in income from animal production is very necessary to improve on the income and living standard of animal producers, particularly those in the credit constrained group.

Generally, the monthly income of subgroups 1A and 1B was relatively higher than that of other households living in rural Vietnam. Again, this reflects the important role of animal production in income generation for the rural households of Hai Duong Province as well as in Vietnam in general. Subgroup 2A includes non-credit constrained households. The monthly income of subgroup 2A (1.51 mil.VND) was higher than that of the other rural households in Vietnam. It likely shows that a reduction of credit constraints could contribute to increased incomes for farmers who were involved in various activities.

Furthermore, according to (Kizilaslan and Adiguzel 2007) the high income of borrowers may have positive effect on their ability to repay loans. The relationship between income and the loan repayment ability of rural borrowers is expected to be positive.

It should be noted that the number of households in subgroup 2B occupied 49% of the total number of surveyed households. The monthly income of subgroup 2B was slightly lower than that of rural households in Vietnam overall and significantly lower than that of urban households in Vietnam and households in the Red River Delta region as well. Therefore, local policy makers should give great attention to increasing the income of subgroup 2B.

6.5. Cost and return analysis of animal production

Agricultural credit is an integral part of the process of modernization of agriculture and commercialization of the rural economy. Agriculture as a sector depends more on credit than any other sector of the economy because of the seasonal variations, the farmer's return and a changing trend from subsistence to commercial farming (Abedulla et al. 2009). When credit is rationed, some borrowers cannot obtain the amount of credit they desire at the prevailing interest rate. In such circumstances, liquidity can become a blinding constraint on many farmer operations. Facing such a situation, households have to choose how to invest and what inputs to buy, depending on the level of credit they receive (Kohansal et al. 2008). Access to credit generally improved efficiency by leveraging cash constraints to buy better quality inputs and services. Thus, easier access to credit for cash-constrained farms would help improve overall efficiency (Akter et al. 2007). Credit may provide farmers with the opportunity to earn more money and improve their standard of living (Abedulla et al. 2009).

As pointed in subsection 5.2.1, there were some differences in the age and education level of the household head, area of the fish pond and total value assets between the animal-based group and the non animal-based group. The remaining household characteristics were similar. With respect to credit access, 22% of households in animal-based group and 72% households in non animal-based group faced credit constraints (Figure 6.11). Credit constraints generally had a negative influence on income. Therefore, it is assumed that among households in animal-based group, a given production unit (i.e. 100 head of chicken, 100 kg of pig live weight or 1 *sao* of fish pond), non-credit constrained households obtained a higher income than credit-constrained households. A similar assumption is applied to the non-animal based group. An additional assumption is that credit-constrained households in animal-based group, having a higher education level and broader experience in animal production generate higher income than credit-constrained households in non animal based-group. Following this point of investigation, the cost and return analysis of animal production was investigated to compare income from animal production among the four subgroups, which differed as to credit accessibility.

Concerning poultry production, for the surveyed households, this included chickens and ducks. Chickens were the predominant poultry type, raised free-range but fed a little rice and some industrially manufactured feed. All surveyed households kept chickens, probably because of convenience and income generation: (i) less labor required; (ii) providing food for household consumption, especially where the market place is far from the household and not held regularly; (iii) creating a source of cash in a time of need; and (iv) contribution to

increased household income. The surveyed households kept chickens both for household consumption and selling at the market.

Table 6.17 presents a comparison of input expenditures for chicken production and income among the four groups. Regarding input costs, the intermediate cost was not significantly different among the four groups. However, cost of stock, veterinary care and vaccination were significantly different among some groups.

Table 6.17. Cost and return analysis of chicken production
(per 100 birds of chicken)
Unit: 1,000s VND

Indicators	Animal-based group		Non animal-based group		P values
	Subgroup 1A	Subgroup 1B	Subgroup 2A	Subgroup 2B	
	Non-credit constrained	Credit constrained	Non-credit constrained	Credit constrained	
Gross output (GO)	13,339 ^a	11,502 ^b	12,227 ^c	10,793 ^d	0.00 ^{***}
Intermediate cost (IC)	8,697	8,517	8,644	8,468	0.20
- Breeding stock	1,108 ^a	1,002 ^a	1,080 ^b	985 ^b	0.00 ^{***}
- Feed	6,930	6,893	6,972	6,917	0.97
- Veterinary care and vaccination	512 ^a	472 ^{ab}	447 ^b	417 ^b	0.04 ^{**}
- Other	149 ^{ab}	152 ^a	145 ^b	149 ^{ab}	0.08 [*]
Value added (VA)	4,641 ^a	2,984 ^b	3,583 ^b	2,325 ^c	0.00 ^{***}
Interest payment	253 ^a	186 ^{ab}	107 ^{bc}	60 ^c	0.00 ^{***}
Depreciation	177 ^a	158 ^b	141 ^c	100 ^d	0.00 ^{***}
Return to family labor	4,210 ^a	2,639 ^c	3,335 ^b	2,164 ^c	0.00 ^{***}
VA/GO (%)	34 ^a	26 ^b	28 ^b	21 ^c	0.00 ^{***}
Return to family labor/Total cost (%)	47 ^a	30 ^c	38 ^b	26 ^b	0.00 ^{***}

Source: Household survey, 2011.

Note: ^{***}, ^{**} and ^{*} are significant levels at 1%, 5% and 10%, respectively; ^{abcd} means in the same row without common letter are different at P < 5% by Ducan test.

The breeding stock cost of subgroups 1A and 1B was slightly higher than that of subgroups 2A and 2B, respectively. Generally, subgroups 1A and 1B had more experience in selection of breed for purchase. Thus, they decided to purchase a good quality breed, which required higher expenditure. Breeding quality is an important production input closely associated with animal productivity. Breeding quality involves the type of breed and the original supply source. Better breed quality will create a higher yield and a higher quality of products. Better breed quality also infers disease-free and likely a reduced production risk. Concerning poultry breeds, the surveyed farmers raised both local breeds (Ri, Mía, Đông Tảo, Tre) and improved breeds (Lương Phượng, Gà Trắng).

With more experience in breeding selection and without credit constraints, subgroup 1A was able to select a good breeding quality. But due to limited experience in breeding selection and credit constraints, subgroup 2B invested a lower amount of money in the breed they raised. Many households in subgroup 2B purchased their breeding chickens in commune markets or from small-scale breeders. They indicated that chicken breeds sold in the market were lower priced than those from other sources. It was found that a high volume of chicken stock originating in China was smuggled in as breeding sources and was sold in commune markets. Smuggled chickens typically were not disease-free. As is true of other provinces in the Red River Delta region, Hai Duong Province annually receives a large volume of poultry smuggled in from China and disease outbreaks are common. In addition, poultry stock supplied by small-scale breeders and dealers seemingly was of better quality than smuggled poultry stock. However, all breed sources had no quality certification of the poultry stock. Currently, in Vietnam, the CP Group and Japfa Comfeed are the main poultry stock suppliers, holding 85% of the domestic volume of poultry breeding. Small-scale poultry households are unable to purchase directly poultry stock from the CP Group and Japfa Comfeed because these dealers mainly provide poultry stock to commercial poultry farms. Small-scale poultry raising households normally did not purchase poultry stock from the CP Group and Japfa Comfeed through retailers because of its high price. A similar situation exists on the study site. Notably, purchasing of animal stock commonly requires a cash payment. In addition, the better quality stock commonly required a higher expenditure. Therefore, many farmers indicated that they could access good stock quality if they had more cash available.

The four subgroups faced similar feed costs. However, the price paid to purchase feed by subgroups 1A and 2A was lower compared to that of subgroups 1B and 2B, respectively. On average, the purchasing price of complete chicken feed by subgroups 1A, 1B, 2A and 2B was 9,600VND per kg, 10,200 VND per kg, 10,000 VND per kg and 10,500 VND per kg, respectively (Appendix 8). This means that subgroups 1A and 2A seem to invest a higher amount in feed than subgroups 1B and 2B. Subgroups 1A and 2A without credit constraints had enough cash to invest a high amount of feed for their chicken. It should be explained that, the surveyed households mainly used industrial feed which was purchased from feed sellers and also used part of their own rice for chicken production. Therefore, it was not easy to collect exact data on the amount of feed used for their chicken production.

Turning back to the price of feed purchasing, subgroups 1A and 2A purchased feed at a lower price compared to the remaining groups, because subgroups 1A and 2A normally paid in cash for their feed purchasing. Subgroups 1B and 2B commonly purchased their chicken feed from village dealers with deferred payment because of lack of cash. Using deferred payment for feed purchasing, subgroups 1B and 2B had to purchase their chicken feed at a high price. It is common in the rural areas of Vietnam as well as in Hai Duong Province that due to lack of cash, farmers normally used deferred payment for feed and fertilizer, purchasing them at a high price from the village dealers. Therefore, the credit supply plays a very important role for investment in agricultural production generally and in animal production in particular.

Regarding veterinary costs, the cost of veterinary medical and vaccination services of subgroup 1A were higher than that of subgroups 2A and 2B, respectively. Subgroup 1A spent 512,000 VND on veterinary services while subgroups 2A and 2B spent 447,000 VND and 417,000 VND, respectively. Vu (2003) also pointed out that the fees charged for veterinary services may create an access problem to poorer farmers, and the death of animals are much more devastating to them.

In terms of economic return, gross output of subgroups 1A and 2A were significantly higher than that of subgroups 1B and 2B, respectively, because the yield of chickens and selling price of subgroups 1A and 2A were higher than those of subgroups 1B and 2B. For example, the chicken yield of subgroup 1A was 2.3 kg per bird while that of the subgroup 1B was 2.0 kg per bird. It can be concluded that the high input investment and better experience in chicken production created the high yield. In addition, the chicken selling price of subgroups 1A, 1B, 2A and 2B were 60,000 VND per kg, 59,000 VND per kg, 56,800 VND per kg and 56,000 VND per kg (Appendix 9).

It should be highlighted that the return to family labor of subgroups 1A and 2A was considerably higher compared to subgroups 1B and 2B, in turn. The return to family labor of subgroups 1A, 1B, 2A and 2 B were 4,210,000 VND, 2,639,000 VND, 3,335,000 VND and 2,164,000 VND thousand VND, respectively. Generally, the return indicators show that, given the number of chickens raised, non-credit constrained producers earned a higher income from chicken production than credit constrained producers.

Especially, despite being in the same unit production and with no difference in intermediate costs, subgroup 1A created significantly higher outputs and higher economic efficiency, including gross output, return to family labor, ratio of VA to GO and ratio of return to family to total cost than those of subgroup 2B. It implies that with better credit access and better production experience, subgroup 1A received a higher income and higher economic efficiency than subgroup 2B. In other words, both credit access and non-credit factors played an important role in increasing chicken production income.

The influence of credit use on poultry production efficiency was confirmed by Kwasi and Tham-Agyekum (2011). The authors indicated that there was a significant difference between the net income of large-scale poultry farmers who used credit and those who did not. They revealed that formal credit had a positive effect on the net income of large-scale poultry farmers.

Concerning pig production, a cost and return analysis is presented in Table 6.18. Given the output unit, there were some differences in input expenditure for fatling pig production among the four subgroups. The comparison of input costs, the cost of stock, veterinary medical and vaccination services of subgroups 1A and 2A were higher than those of subgroups 1B and 2B, respectively, because subgroups 1A and 2A received the full required borrowing amount for their input purchases.

In terms of breed, the quality of pig breed is a very important production input. The better quality of pig breed used, the higher productivity of live pig meat is produced. The pig breed mainly originated from small breeding producers in Hai Duong Province. A good breeding quality commonly requires a high amount of money expenditure. With credit constraints, it was difficult for subgroups 1B and 2B to purchase pig breeds in good quality. In contrast, subgroups 1A and 2A purchased a better quality of pig breed thanks to having no credit constraints. In Hai Duong Province, it is found that a change in price of pig meat commonly leads to a change in price of pig breed. If the price of pig meat increases, the price of the pig breed increases more quickly, because many farmers prefer to raise that type of pig. The poor farmers, who lack the financial capital, find it more difficult to purchase a good quality breed.

Regarding feed use, the appropriate investment in feed will create optimal productivity of pig production. The feed cost of subgroup 1A was significantly higher than that of subgroup 1B. However, subgroup 1A purchased pig feed at a lower price (8,800 VND per kg) than subgroup 1B (9,200 VND per kg). It is pointed out that subgroup 1A used a higher amount of feed for their pig production than subgroup 1B.

Table 6.18. Cost and return analysis of fattling pig production
(per 100 kg of live weight)
Unit: 1,000sVND

Indicators	Animal-based Group		Non animal-based group		P values
	Subgroup 1A	Subgroup 1B	Subgroup 2A	Subgroup 2B	
	Non-credit constrained	Credit constrained	Non-credit constrained	Credit constrained	
Gross output (GO)	4,754 ^a	4,161 ^b	3,936 ^c	3,869 ^c	0.00 ^{***}
Intermediate cost (IC)	3,730 ^a	3,357 ^b	3,083 ^c	3,127 ^c	0.00 ^{***}
- Breeding stock	742 ^a	691 ^b	701 ^a	684 ^b	0.12 [*]
- Feed	2,844 ^a	2,544 ^b	2,249 ^c	2,319 ^c	0.00 ^{***}
- Veterinary care and vaccination	91 ^a	71 ^c	81 ^b	69 ^c	0.00 ^{***}
- Other	53	51	52	54	0.38
Value added (VA)	1,023 ^a	804 ^b	853 ^b	743 ^c	0.00 ^{***}
Interest payment	59.3 ^a	42.9 ^{ab}	32.3 ^{ab}	20.4 ^b	0.01 ^{***}
Depreciation	49 ^a	21 ^c	28 ^b	22 ^c	0.00 ^{***}
Return to family labor	915 ^a	739 ^b	792 ^{ab}	707 ^b	0.01 ^{***}
VA/GO (%)	22	19	21	18	0.22
Return to family labor /Total cost (%)	24	22	25	22	0.68

Source: Household survey, 2011

Note: * and *** are significant levels at 10% and 1%, respectively; ^{abc} means in the same row without common letter are different at P < 5% by Ducan test.

In terms of vaccination and veterinary costs, subgroup 1A and 2A spent more money on prevention and treatment than subgroups 1B and 2B, respectively. This does mean that an increased expenditure for vaccination and veterinary services always results in high pig productivity. The surveyed farmers reported that cash availability enabled them to use vaccination and veterinary services in a timely manner. Subgroups 1A and 2A normally spent money on prevention.

Taking into account the variable inputs, the intermediate cost of subgroup 1A was significantly higher than that of subgroup 1B. In addition, the intermediate cost of subgroup 1A was the highest among the four groups because pig production was one of the main income sources of this group. Therefore, subgroup 1A invested highly in inputs for pig production.

Regarding fixed costs, the interest payment and depreciation of subgroup 1A were higher than those of subgroup 2B. Subgroup 1A borrowed a higher amount of money than subgroup 2B. Therefore, the interest payment of subgroups 1A and 1B was higher than that of subgroup 2B. The depreciation of subgroup 1A was higher than that of subgroup 2B, due to a higher value of fixed assets, including the pig shelter and other equipment.

Coming to output indicators, the data in Table 6.18 shows that gross output, value added and return to family labor of subgroup 1A were significantly higher than those of subgroup 1B. Given the unit of output, the gross output of subgroup 1A was 4,754,000 VND while that of the subgroup 1B were 4,161,000 VND. The difference in gross output was due to differences in the selling price and yield. On average, the selling price of subgroups 1A, 1B were 47,500 and 41,000 VND per kg, respectively (Appendix 9). The value added of subgroups 1A and 1B was 1,023,000 VND and 804,000 VND, respectively. Notably, the return to family labor of subgroup 1A was 915,000 VND, whereas that of subgroup 1B was 739,000 VND. Overall, those figures indicate that the non-credit constrained households earned a higher income than the credit constrained households.

Concerning subgroups 1A and 2B, the intermediate cost of subgroup 1A was significantly higher than that of subgroup 2B due to the better credit access of subgroup 1A. In addition, the gross output, value added and return to family labor of subgroup 1A were significantly higher than those of subgroup 2B, resulting from better experience in production and marketing information. It showed that both credit and non-credit factors considerably influenced outputs of pig production.

Fish production generated an important part of animal production income. The cost and return analysis for fish production is demonstrated in Table 6.19. The intermediate cost of subgroups 1A and 2A were significantly higher than those of subgroups 1B and 2B, respectively. The input investment was significantly different among groups, due to differing credit accessibility. In addition, the expenditure on breed stock by subgroup 1A and 2A was significantly higher than those of subgroups 1B and 2B, respectively. The fish breeds included *cirrhinus* (cá trôi), *ctenopharyngodon idella* (cá trắm), *tilapia* (cá rô phi), *cyprinus carpio* (cá chép) and *ophiocephalus maculatus* (cá quả), the fish breeds mainly supplied by small breeding producers in Hai Duong Province. Farmers indicated that without credit constraints, they selected a large-size fish breed that, despite being expensive, could create high income.

It was found that farmers used industrially manufactured feed, crop residues and grass to feed their fish. However, industrial feed occupied a main part of the total cost of feed. The feed cost of subgroup 1A was significantly higher than that of subgroup 2B. Better credit accessibility enabled subgroup 1A to invest in a higher quantity of feed to obtain a higher yield of fish. In addition, the interest payment and depreciation were significantly higher for subgroup 1A compared to subgroup 2B. Subgroup 1A borrowed a higher amount of money than subgroup 2B. They also used a higher amount of their own money to construct a fish pond than subgroup 2B.

Table 6.19. Cost and return analysis of fish production per 1 sao¹

Unit: 1,000s VND

Indicators	Animal-based group		Non animal-based group		P values
	<u>Subgroup 1A</u>	<u>Subgroup 1B</u>	<u>Subgroup 2A</u>	<u>Subgroup 2B</u>	
	Non-credit constrained	Credit constrained	Non-credit constrained	Credit constrained	
Gross output (GO)	11,793 ^a	10,355 ^b	9,061 ^c	7,705 ^d	0.00 ^{***}
Intermediate cost (IC)	8,002 ^a	7,207 ^b	6,347 ^c	5,497 ^d	0.00 ^{***}
- Breeding stock	2,960 ^a	2,500 ^b	2,071 ^c	1,445 ^d	0.00 ^{***}
- Feed	4,698 ^a	4,385 ^{ab}	3,946 ^{bc}	3,820 ^c	0.00 ^{***}
- Other	344	321	329	232	0.00 ^{***}
Value added (VA)	3,791 ^a	3,148 ^b	2,714 ^{bc}	2,208 ^c	0.00 ^{***}
Cost of pond renting	61	77	22	23	0.47
Interest payment	174 ^a	135 ^a	136 ^a	71 ^b	0.00 ^{***}
Depreciation	634 ^a	427 ^b	200 ^c	173 ^c	0.00 ^{***}
Return to family labor	2,920 ^a	2,507 ^{ab}	2,355 ^{ab}	1,938 ^b	0.00 ^{***}
VA/GO (%)	32	30	30	28	0.41
Return to family labor/Total cost (%)	33	32	35	34	0.85

Source: Household survey, 2011

Note: ¹“sao” is common unit used in the Red River Delta, including Hai Duong. 1 sao = 360 m²; *** are significant levels at 1%; ^{abcd} means in the same row without common letter are different at P < 5% by Ducan test.

As presented in Table 6.19, there were differences of output values among the groups. The gross output of subgroups 1A and 2A was higher than that of subgroups 1B and 2B, respectively. Without credit access constraints, the high gross output of subgroups 1A and 2A partly resulted from high input expenditure. It bears repeating that subgroup 1A and subgroup 2B were characterized by differences in credit access, production experience and marketing information. The return to family labor of the subgroup 1A was significantly higher than that of the subgroup 2B. On average, return to family labor of the subgroup 1A was 2,920,000 VND whereas that of the subgroup 2B was 1,938,000 VND.

In summary, with better credit accessibility and similar non-credit factors (i.e. production experience and marketing), subgroup 1A had a significantly higher return to family labor in pig production than subgroup 1B. In addition, differences in the credit accessibility and non-credit factors caused significant differences in return to family labor of all types of animal (i.e. chicken, pigs and fish) between subgroups 1A and 2B. It can be concluded that for a given production unit, the non-credit constrained group generated a higher return to family labor in animal production as compared with the credit constrained group.

6.6. Influence of credit and non-credit factors on return to family labor from animal production

Analysis results of Chapter 5 shown that credit supplied by VBARD and PCFs were mainly used to purchase variable inputs. Due to limited borrowing amount, credit used for upgrading a shelter or a fish pond and purchasing of production equipment was very small amount. This part aims to analyze the influence of credit and non-credit factors on return to family labor from animal production.

Access to credit allows farmers to optimize input usage for a given set of fixed assets in the short term. Credit constrained farmers will use inputs only up to their capital availability. In particular, the amount of liquidity of a constrained household influences the overall profit level. The misallocation of inputs in agricultural production may cause the credit-constrained farmer to have lower profit than the non-credit constrained farmer (Feder et al. 1990).

Traditional measures of the impact of access to credit on economic outcomes have relied on estimates of marginal effects of the loan amount or program membership, both of which have shortcomings. Firstly, program membership and amount of credit demand are potentially endogenous to the outcomes of interest, that is, the participation decisions of individuals within a household. Secondly, the validity of the estimates of impact of the amount depends on the assumptions that at the time of obtaining credit, the credit limit was binding and the program was the only source of credit (Feder, Lau, Lin, & Lou, 1990, as noted in (Diagne and Zeller 2001).

The use of the amount borrowed is not appropriate if households decide not to participate in the credit market because it is not an optimal strategy for them or if the marginal impact of credit is negligible (Diagne and Zeller 2001). Thirdly, most credit programs offer a bundle of services such as literacy training, family planning and training for income-generating activities. Hence, it is impossible to separate out the causal effects of credit from the effects due to other services provided (Pitt and Khandker 1998).

In reality, it was difficult to separate the influence of credit and the influence of non-credit on income from pig, poultry and fish production. Given the current production and marketing situation, this study attempts to analyze the influence of credit constraints and non-credit factors on the return of family labor from pig, poultry and fish with the same production unit (100 head of chicken, 100 kg of live pig weight and 1 *sao* of pond fish).

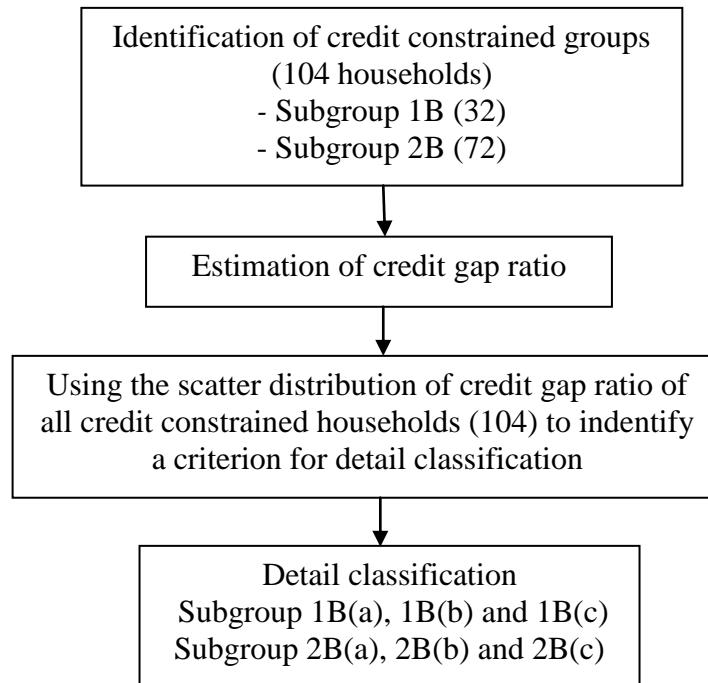


Figure 6.15. Step of identification of subgroups 1B(a), 1B(b), 1B(c), 2B(a), 2B(b) and 2B(c)

As mentioned early, based on the credit accessibility of households, the credit constrained household was defined. Of 104 credit constrained households, the number of credit constrained households of the animal based group and the non animal-based group was 42 and 72, respectively. The number of credit constrained households in the animal-based group was lower than that in the non animal-based group, because the number of households in the animal-based group accounted for 40% of the number of surveyed households. Next, the scatter distribution of credit gap ratio of all credit constrained households was used to identify a criterion for classification of credit constrained households into different subgroups (Figure 6.15). The credit gap ratios of credit constrained households ranged from 0-53%. Then, subgroups 1B and 2B were classified into different subgroups, including subgroup 1B(a), 1B(b), 2 B(a) and 2B(b) (Table 6.20).

The credit gap ratio can be considered as the level of credit constraints. The higher the credit gap ratio, the higher level of credit constraints occurs. It was found that the number of households of subgroups 1B(b) and 1B(c) occupied about 78% of total households in subgroup 1B. The number of households of subgroup 2B(b) and 2B(c) also accounted for about 80% of total households in subgroup 2B. It revealed that with the current scale of animal production, many households in subgroups 1B and 2B need more loans to cover their expenditure on variable inputs for animal production. It should be emphasized that most of them not only engaged in poultry and pig production but also had a large area of fish pond. Therefore, they had to maintain their fish production, resulting in a strong demand for credit.

Table 6.20. Subgroup classification based on credit gap ratio

Credit gap ratio (%)	Animal-based group		Non animal-based group	
	Subgroup 1B Credit constrained		Subgroup 2B Credit constrained	
	Name	Num. households	Name	Num. households
Up to 14	Subgroup 1B(a)	7	Subgroup 2B (a)	15
15-30	Subgroup 1B(b)	10	Subgroup 2B (b)	20
31-53	Subgroup 1B(c)	15	Subgroup 2B (c)	37
	Total	32		72

Source: Household survey, 2011

Higher input expenditures are presumably associated with higher productivity growth (Saeed et al. 1996). The comparison of return to family labor among subgroups 1B(a), 1B(b) and 1B(c) is shown in Table 6.21. It is realized that subgroup 1B(a) received highest income from chicken, pig and fish production among the three subgroups. Next, subgroup 1B(a) also received higher income from chicken, pig and fish production than that subgroup 1B(c). P values and the Ducan test confirmed that there were significant differences of return to family labor among three groups. In addition, the variation in income from fish production was much higher than the variation in income from chicken and pig production due to fish production requiring higher input expenditure to generate higher income.

Table 6.21. Comparison of return to family labor among subgroups in subgroup 1B
Unit: 1,000s VND

Return to family labor	Animal-based group			
	Subgroup 1B			
	Subgroup 1B (a)	Subgroup 1B (b)	Subgroup 1B (c)	P values
Per 100 birds of chicken	2,642 (448)	2,703 (589)	2,597 (648)	0.36
Per 100 kg of pig live	973 ^a (258)	780 ^b (221)	597 ^c (318)	0.00 ^{***}
Per 1 <i>sao</i> of fish pond	3,212 ^a (215)	2,812 ^b (194.1)	1,976 ^c (466)	0.00 ^{***}

Source: Household survey, 2011.

Note: The values in brackets were standard deviation; *** are significant levels at 1%; ^{abc} means in the same row without common letter are different at P < 5% by Ducan test.

Furthermore, to investigate the influence of credit and non-credit factors on reduction in return from animal production per given production unit, the relevant credit factors and non-credit factors were first selected, based on existing constraints to animal production and marketing, as discussed early. Secondly, farmers were asked whether each factor caused a reduction in their income or not. Finally, the total accumulated percentage was used to rank the level of reduction in return to family labor.

Among three subgroups, the percentage of households in subgroup 1B(c), who had a low investment on feed, disease prevention and breed quality, was the highest. Of the total households in subgroup 1B, 93% had a low investment on feed quantity and quality; 60% responded that they had a low investment on their disease prevention; 80% complained that their expenditure on breed quality was limited. The data in Table 6.22 shows that the subgroup with a high credit gap ratio had a low investment in variable inputs for animal production. In other words, the high level of credit constraints of animal producers caused the low level of input expenditure for their production. Concerning non-credit factors, among the three subgroups there was a similar influence of non-credit factors on the reduction in return to family labor. It is indicated that, among the credit constrained households, non-credit factors had a similar influence on the reduction in income. From the discussion, it can be concluded that the households in subgroup 1B were also influenced by non-credit factors. The households with a higher level of credit constraints had a lower income from animal production than the households with a lower level of credit constraints.

Table 6.22. Influence of credit and non-credit factors on the reduction in return to family labor for subgroup 1B (in the animal based-group)

Unit: Percentage

	Factors	Subgroup 1B (n=32)		
		Subgroup 1B (a) n= 7	Subgroup 1B (b) n=10	Subgroup 1B (c) n=15
Related credit factors	-Low investment in feed	71	80	93
	-Low investment in disease prevention	43	60	67
	-Low investment in breed quality	57	80	80
	<i>Subtotal of accumulated percentage</i>	171	220	240
Non-credit factors	-High and rapid increase in feed price	100	100	100
	-Weak capability for disease prevention and treatment due to lack of knowledge	57	50	54
	-Limited access to relevant market information and weak bargaining power	43	60	59
	<i>Subtotal of accumulated percentage</i>	200	210	213
Total accumulated percentage		371	430	453
Ranking level of reduction in return to family labor		I	II	III

Source: Household survey, 2011

Note: Data in Table 6.22 was presented as a percentage of households who answered that each factor actually caused the reduction in return to family labor.

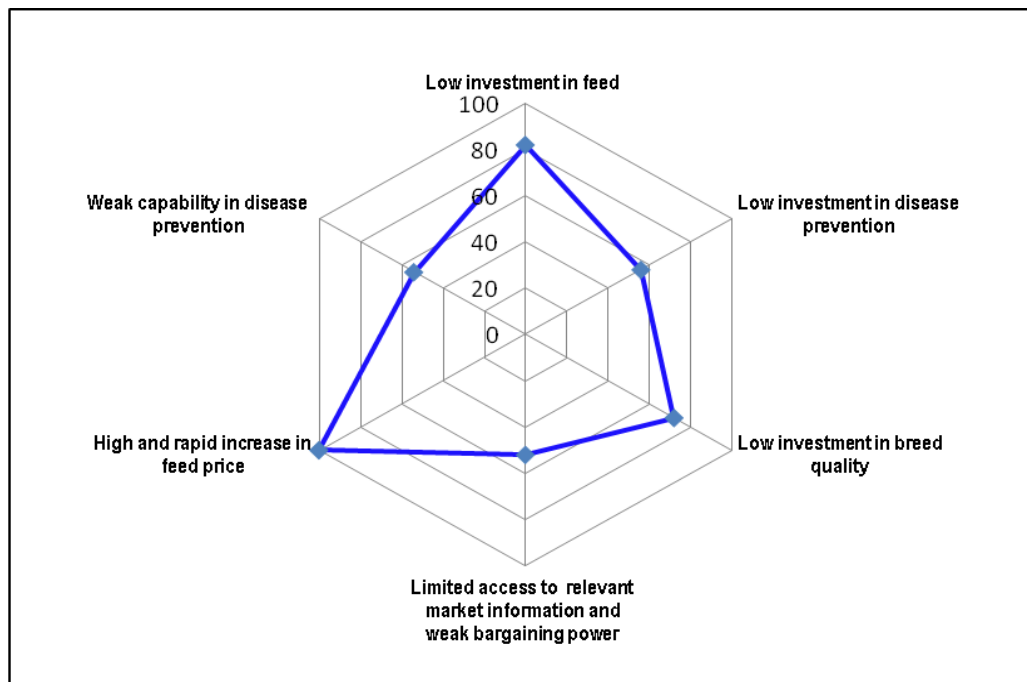


Figure 6.16. Influence of credit and non-credit factors on the reduction in return to family labor of credit constrained households in the animal-based group

Source: Household surveyed, 2011

Table 6.23. Comparison of return to family labor among subgroups in the subgroup 2B
Unit: 1,000s VND

Return to family labor	Non-animal based group			
	Subgroup 2B			P values
	Subgroup 2B (a)	Subgroup 2B (b)	Subgroup 2B (c)	
Per 100 birds of chicken	2,439 ^a (829)	2,296 ^{ab} (770)	1,982 ^b (509)	0.05 ^{**}
Per 100 kg of pig live	879 ^a (370)	689 ^{ab} (209)	592 ^b (289)	0.10 [*]
Per 1 <i>sao</i> of fish pond	2,720 ^a (389)	2,014 ^b (504)	1,447 ^b (593)	0.00 ^{***}

Source: Household survey, 2011

Note: The values in brackets were standard deviation; *, **, and *** are significant levels at 10%, 5% and 1%, respectively; ^{abc} means in the same row without common letter are different at P < 5% by Duncan test.

The return to family labor among subgroups 2B(a), 2B(b) and 2B(c) is illustrated in Table 6.23. P values show that return to family labor was significantly different among the three subgroups. Given the same production unit, the return to family labor from animal production of subgroup 2B(a) was highest. The Duncan test confirmed that there was a significant difference of return to family labor between subgroup 2B(a) and subgroup 2B(c). Among the three groups, the variation in income from fish production was higher than that from chicken and pig production because fish production generally needed more capital investment than pigs and chickens. In conclusion, the household group with a low credit gap ratio generates a higher income from animal production than the household groups with the high credit gap ratio.

Investigation into the influence of credit and non-credit factors on the reduction in return to family labor was also done for subgroup 2B with the mentioned steps above. The analysis of subgroup 2B yielded a similar finding from an analysis of subgroup 1B. The households in subgroup 2B were likewise influenced by non-credit factors. The households with a higher level of credit constraints had a lower income from animal production than the households with a lower level of credit constraints (Table 6.24).

Table 6.24. Influence of credit and non-credit factors on the reduction in return to family labor for subgroup 2B (in the non animal based-group)
Unit: Percentage

	Factors	Subgroup 2B (n=72)		
		Subgroup 2B (a) n= 15	Subgroup 2B (b) n=20	Subgroup 2B (c) n=37
Related credit factors	-Low investment in feed	73	85	94
	-Low investment in disease prevention	53	65	70
	-Low investment in breed quality	67	70	86
	<i>Subtotal of accumulated percentage</i>	193	220	250
Non-credit factors	-High and rapid increase in feed price	100	100	100
	-Weak capability of disease prevention and treatment due to lack of knowledge	66	65	64
	-Limited access to market information and weak bargaining power	54	60	63
	<i>Subtotal of accumulated percentage</i>	220	225	227
Total accumulated percentage		413	445	477
Ranking level of reduction in return to family labor		I	II	III

Source: Household survey, 2011

Note: The percentage value in Table 6.24 was presented as the percentage of households in each group who answered that each factor actually caused the reduction in return to family labor.

Briefly, the finding shows that animal production of both the animal-based group and the non animal-based group was influenced by credit and non-credit factors. Within each group, the non-credit factors had a similar influence on income from animal production. Credit accessibility differed from one household to another. As a result, for a given production unit, households with credit constraints generated a lower income from animal production than households without credit constraints. In other words, better access to credit enabled the animal producers to make a higher input expenditure that generated higher income from animal production.

Since credit constrained households cannot optimize production, resulting in inefficient production, the task of the Vietnamese government is to develop the rural financial system to ensure that every household has access to credit and can maximize their production (Duong and Izumida 2002). Furthermore, the study finding suggests that non-credit factors including strengthening of feed supply, capability of disease prevention, access to market information and bargaining power also should be improved to increase income for small animal producers.

6.7. Animal producing household's expenditure and credit need for investment in fixed production assets

The consumption expenditure of households can be considered as one of the indicators reflecting the household's living standard. The surveyed household expenditure was grouped into four main parts. The expenditure in daily consumption included food consumption, electricity, fuel, etc., which were basic needs of farm households. The expenditure for other consumption purposes consisted of clothing, education, medical and special events (e.g. wedding or funeral). A substantial proportion of income used for reinvestment in animal production and fish pond upgrading. And small part of income used for repayment of interest rate and old loan. As mentioned earlier, the surveyed households indicated that raising animals was a means of savings. However, they actually did not create any savings in cash due to expenditure for basic needs consumption and capital reinvestment for animal production.

Table 6.25. Expenditure of animal producing households
Unit: Percentage

Purposes	Animal-based group	Non animal-based group
Expenditure for daily consumption	48	58
Expenditure for other consumption purposes	21	25
Reinvestment in animal production and fish pond upgrading	27	11
Interest and loan repayment	4	6
Total	100	100

Source: Household survey, 2011

As presented in Table 6.25, expenditure for daily consumption took a major part of the income of both groups. Of the total income, the daily consumption expenditure of the animal-based group accounted for 48% while that of the non animal-based group was 58%. Similarly, the share of expenditure for other consumption purposes was 21% for the animal-based group and 25% for the non animal-based group. Food and other basic needs of the animal-based group were about 3.5 mil.VND per month whereas that of the non animal-based group was 2.6 mil.VND per month. In addition, expenditures for other consumption purposes of the animal-based group and the non-animal based group were 1.4 mil. VND and 1.1 mil.VND per month, respectively.

Regarding reinvestment in animal production, the share of income used to buy stock, feed and upgrade a fish pond took 27% for the animal-based group and 11% for the non animal-based group. These figures indicate that the animal-based group had to allocate a relatively high portion of income to maintain its animal production. Of the total income, reinvestment in animal production and fish pond upgrading accounted for a low share due to low income. Repayment of loans and interest occupied a small part of total income because farmers mainly repaid loans from the informal sector with very short lending terms. In addition, in Table 6.25 the percentage of loan and interest payments was calculated for the total number of sample households. In fact, part of the sample households had loans from the informal sector. Further discussion about loan repayment is presented in the next section.

It must again be borne in mind that loans received from VBARD and PCFs were used entirely on expenditures for variable inputs (feed and stock). In addition, loans from VBSP and the informal sectors were mainly used for consumption purposes. It was also found that many animal producing households also desired to borrow money for upgrading or construction of livestock shelters and/or fish pond. Many farmers reported that they understood that a good livestock shelter was a factor for good hygiene and that livestock disease could thereby be reduced. Notably, upgrading of a fish pond required a high expenditure. Although many farmers already allocated part of their income to upgrading the fish pond, their own money was insufficient for the needed investment. Due to limited access to credit, they had to borrow money for feed and stock purchasing. Many farmers desire to borrow money at a favorable interest rate for fixed asset investment, including a livestock shelter and/or fish pond.

6.8. Loan repayment

It is important that credit be invested in productive business or production and that the additional income be used to repay loans in order for the borrower to have a sustainable business or production and a sustainable relationship with credit institutions. However, failure by farmers to repay their loans on time or to repay them at all has been a serious problem faced by both agriculture credit institutions and smallholder farmers. Poor loan repayment in developing countries has become a major problem in agricultural credit administration, especially for smallholders who have limited collateral capabilities (Okarie 2004).

Table 6.26. Loan repayment by surveyed households

	Animal-based group		Non animal-based group	
	Number of loans received in 2010	Repaid loans (%)	Number of loans received in 2010	Repaid loans (%)
Formal sector				
- VBARD	32	100	13	100
- VBSP	11	0.0	21	9.0
- PCFs	10	100	6	100
Informal sector				
- Friends and relatives	7	100	26	100
- Village moneylenders	6	100	10	100

Source: Household survey, 2012

Recently, the lending terms of loans from VBARD, VBSP and PCFs were two years, two to five years and one year, respectively. The lending terms of loans from friends, relatives and village moneylenders was two to three months. In 2012, the second survey round was conducted to collect information on loan repayment by households that had obtained credit in 2010. It was found that all households repaid their loans on time. Most loans from VBSP were granted to borrowers for their children's education and had five-year lending terms. Therefore, of the total number of loans supplied from VBSP to borrowers in the non animal-based group, 9% of loans were repaid in 2012. The remaining outstanding loans are still being used by the borrowers.

It was found that all borrowers repay their loans on time. Internal and external factors affect the ability of the surveyed households to repay loans on time (Figures 6.17). Firstly, a penalty interest charge of 30% or higher may be imposed on borrowers who do not pay back their commercial loans from VBARD, PCFs and moneylenders within the maturity period. Thus, all borrowers try to repay their loans by the due date. Secondly, the farmers can expect to enjoy access to credit in the future if they do not have a bad reputation regarding debt payment. Desai and Mellor (1993) also stated the good repayment performances of farmers were a guarantee to receive future loans. Thirdly, some characteristics of borrowers partly influenced their loan repayment. Most of the surveyed borrowers had a relatively high level of education, which positively affected their awareness of the need to make prompt loan repayment. In addition, women were primarily engaged in livestock production and loan use. They were commonly worried about their loans. According to Duy (2013), women are generally considered to be better borrowers because they are less likely to spend the loans on nonproductive things (e.g. tobacco or alcohol). Finally, the diversification in animal production could enable farmers to reduce risks and contribute to generate income stably, which ensures that the farmers are able to repay their loans on time. Although animal production generated low profits, it still became a main income source to repay debts of borrowers.

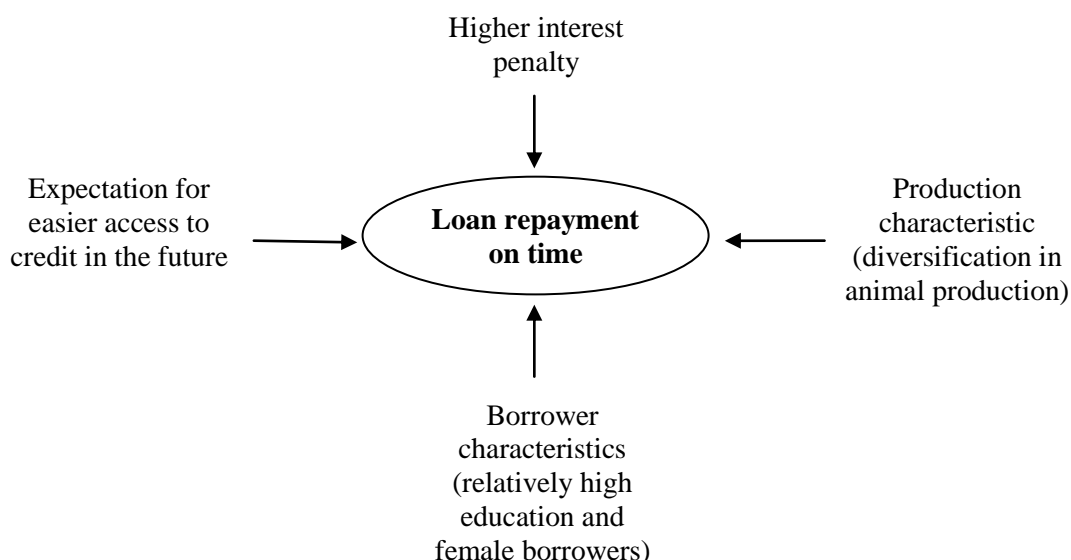


Figure 6.17. Factors affecting loan repayment by surveyed households

As mentioned, the feed price gradually increased and the selling price of animal products fluctuated. In addition, feed cost was a dominant component of production costs. Therefore, Table 6.27 was set up for some scenarios of change in the input and output price for pig production as an example. The feed price, pig price and income in 2010 were selected as base indicators for comparison. The first scenario assumed that the feed price increased by 20% compared to that in 2010. Consequently, income fell by 43%, from 700,000 VND to 300,000 VND. Similarly, in the second scenario, the feed price increased by 30% and as a result income fell from 700,000 VND to 200,000 VND equivalent to 97%. For this reason, the number of households that lost their money accounted for 16% and 40% of pig raising households in the first and second scenarios, respectively.

Regarding the output price, the third scenario assumed that the price of pigs fell by 30%. Consequently, all households suffered loss from pig production. Similarly, all households lost money as the price of pigs fell by 40% in the fourth scenario. From June 2012 to August 2013, the feed price slightly increased and at the same time the pig price dropped considerably compared to previous years, resulting in heavy losses for livestock producers in Vietnam, including those in Hai Duong Province (Cong 2013). The fifth scenario assumed that the price of feed increased by 10%, and the pig price fell by 20% compared to 2010. As a result, 89% of pig-raising households lost 300,000 VND per household. Result analysis of the above scenarios showed that a small increase in the feed price and a small reduction of the output price caused a sharp drop in income. In other words, fluctuation in the feed price and pig price directly affected household income from animal production and indirectly influenced the ability to repay loans.

Table 6.27. Simulation for pig production
(per 100 kg of live pig)

Scenarios	GO (mil.VND)	Feed cost (mil.VND)	Income (mil.VND)	Percentage of household with losses (%)
Average of 2010	4.2	2.5	0.7	4
Increase in feed price by 20%	4.2	3.0	0.27	16
Increase in feed price by 30%	4.2	3.5	0.02	40
Reduction in pig price by 30%	2.9	2.5	-0.4	100
Reduction in pig price by 40%	2.6	2.5	-0.9	100
Increase in feed price by 10% and reduction in pig price by 20%	2.7	3.3	-0.3	89

Source: Scenarios based on data from surveyed households in 2011

Market characteristics, such as price stability of agricultural commodities produced, are found to influence repayment (Ugbomeh et al. 2008). For a better understanding of the relation between the animal production income and the ability of debt repayment of the surveyed borrowers, firstly, two scenarios of reduction in pig price were assumed. Then, animal production incomes of the surveyed borrowers were calculated to compare their animal production incomes with their loan amounts (Table 6.28). It bears repeating that the surveyed borrowers engaged in pig, chicken and fish production. Credit was used for the production of all animal types. Therefore, the total income of animal production needs to be examined for an analysis of loan repayment capability.

Table 6.28. Comparison of animal production income and loan amount by scenario

Income to loan amount ratio (%)	Pig price reduced by 30%			Pig price reduced by 40%		
	Frequency of borrower households ¹ (%)	Income ² (mil.VND)	Loan amount (mil.VND)	Frequency of borrower households (%)	Income (mil.VND)	Loan amount (mil.VND)
< 0	6	-3.7	33.0	16	-6.5	31.6
1-50	30	10.4	34.0	52	4.0	22.0
51-100	34	17.3	24.0	25	17.0	23.0
>100	30	31.0	30.0	7	22.8	18.5
Total	100			100		

Source: Scenarios based on data from survey households in 2011

¹ 61 households obtained credit for their animal production. Of 61 borrower households, 56 households engaged in fattening pigs. In Table 6.28, the frequency of borrower households was calculated by number of borrowers in each range of animal production income to loan amount divided by the number of borrower households producing fattened pigs (56).

² Animal production income includes income from all animal types.

In the first scenario, it was assumed that the pig price fell 30% compared to the 2010 pig price. As a result, 6% of borrower households lost money due to a low pig selling price. 30% of borrower households received very low income from their animal production (10.4 mil.VND per household). 36% of borrower households might default on their loans because their animal production income was much lower than their loan amount. It was assumed that borrowers used loans with a two-year lending term. Receiving very low income from animal production, they had great difficulty to generate enough cash to make their debt payment on time. Similarly, in the second scenario, it was assumed that the pig price fell 40% compared to the 2010 pig price. Consequently, 16% of borrowers might suffer animal production loss. 52% of borrowers obtained a very low income. As a result, it was predicted that 68% of borrowers became defaulters (Table 6.28). Therefore, in the context of a drop in price of animal products, it is very necessary for policymakers to find possible solutions to improve loan repayment prospects, thus ensuring the financial sustainability of formal credit suppliers as well as promoting animal production.

According to the current credit policy (Degree No. 41/2010/ND-CP), in the event an animal epidemic causes heavy losses in many districts and borrowers are unable to pay their debts to VBARD on time, VBARD may consider rescheduling the debt payment for borrowers. In addition, at the same time, VBARD may examine the business or production planning and debt paying capabilities of borrowers and provide new loans for their production despite their outstanding debts. Furthermore, the government allows VBARD to freeze the interest on unpaid loans at the time when an animal epidemic is announced by the local and provincial authorities. The maximum debt-freezing time is two years.

The occurrence of an animal epidemic commonly causes death of animals. Consequently, the animal producers lose money, affecting their ability to repay their loans. Concerning the credit policy, the regulation on rescheduling debts, freezing of debts and providing new loans after the occurrence of a disastrous animal epidemic has been promulgated. However, the market risks, including the increase in feed costs and the decrease of pig price also indirectly causes borrowers to default. It is suggested that the credit policy include a mechanism for rescheduling debts for borrowers who suffer from market risks. VBARD should also improve its implementation of rescheduling of debts.

**Box 6.3. Problem of debt rescheduling
and provision of a new loan after animal disease outbreak**

Mr. Doan, living in Chi Minh village, has engaged in pig production for many years. He usually watches television to get information on production, market and other issues. Thus, he got some information about the credit policy. In 2010, he lost a large amount of money, estimated at about 35 mil.VND, due to a pig disease epidemic. At the same time, his loan from VBARD (20 mil.VND) was reaching maturity. He applied to VBARD for a rescheduling of his debt and for a new loan. VBARD's staff said that in order to receive a new loan he had to pay back his debt. Although suffering from a heavy pig losses, he had to continue in livestock production because he had no other way of earning money for his debt repayment. It looked like he would have to borrow 20 mil.VND from the village moneylender at a very high interest rate to repay his debt. One week later, VBARD accepted to provide him with a new loan to him. He strongly felt that after suffering from a livestock disease, farmers would have a hard time being accepted by VBARD to reschedule debts and take out new loans at the same time. There was a large gap between the written credit policy and actual credit policy implementation by VBARD.

Source: In-depth interview with farmer, 2011

6.9. Family labor employment and gender issues in animal production

The information from the household survey shows that households mostly rely on family labor for their animal production. Daily paid workers were hired for only a few days at the time of fish harvesting. In Hai Duong Province, only holders of large livestock farms tend to hire laborers. Son et al. (2006) reported that registered commercial farms in Vietnam hired more laborers than household farmers. Nevertheless, even for commercial farms, family labor was a large component of their labor and daily paid workers tends to be on a casual basis. Employing family members in livestock husbandry and aquaculture can be economically efficient because many family members of the surveyed households were unable to find paid employment elsewhere in the economy. This is often the case for rural women who are about 35 to 55 years of age. In addition, if non-farm employment is available, the transaction cost of that employment has to be taken into account. Taking advantage of non-farm employment usually involves travel costs and sometimes relocation costs. There are also likely to be costs in terms of on-farm income yielding only a low salary. Furthermore, work on household farms may add to family security, ensuring them of at least a subsistence income in difficult economic times when job shedding may occur in financially constrained non-farm labor markets. Non-farm jobs may not be very secure, especially in an economy in transition. In some circumstances, on-farm employment of household members helps to reduce poverty, promotes the employment of women and provides economic security for families.

In the context of the global financial crisis, it has adverse effects on Vietnam, with hundreds of thousands of workers at industrial parks and enterprises becoming jobless. It was estimated that 30,000 workers lost their jobs in 2008 and 150,000 workers in 2009. Most of the workers who lost their jobs at companies and on industrial parks come from rural areas and now have to return to their rural villages and to continue agricultural production (Thanh et al. 2005).

Agricultural production mainly uses family labor, which is a typical characteristic of this sector. Surveyed farmers worked at several jobs in one day, including crop production, animal production, non-farmer activities and housework. Thus, making an estimate of working time for animal production was quite difficult. When surveyed regarding their work, farmers were asked how what percentage of time they spent on animal production and how what percentage they spent on each type of animal production. The number of days of working time was then estimated relatively.

The animal-based group spent about 202 days on animal production while the non animal-based group worked about 113 days (Table 6.29). For the animal-based group, fish production occupied a main part of working time (46%), followed by pig production (37%) and finally poultry (17%). Farmers indicated that they used both grass and industrial feed to feed their fish. Therefore, they had to spend time cutting grass. In addition, for many households, their fish pond was located far from their house. As a result, farmers also had to spend time commuting. Poultry production required a little less time because farmers could intermingle domestic tasks with poultry feeding. For the non animal-based group, the working time devoted to pig, fish and poultry production was 40%, 35% and 25%, respectively. It was found that the fish pond of the non animal-based group normally was small in area and near the homes of the surveyed households. Thus, fish production occupied the second highest proportion of working time.

Table 6.29. Family working time on animal production and economic return

Indicators	Animal-based group	Non animal-based group
Family labor working time (days)	202	113
Number of family laborers (workers)	2.4	2.5
Economic return to family labor (1,000s VND/ year)	58,670	13,070
Economic return from family labor per worker per day (1,000s VND/ worker/day)	121	46

Source: Household survey, 2011

With respect to gender issues, it was found that female farmers contribute more time to animal production than male farmers because male farmers spent most of their time on non-farm work, such as casual hired labor for construction or in services. The finding was supported by (Son et al. 2006) who pointed out that rural women were also limited in their scope for accepting employment away from their household because of child-rearing duties. In addition, UNDP (1997) revealed that women's participation in livestock development was significant and varies from region to region according to socioeconomic, agro-ecological, ethnic and religious factors (Tipilda and Panhwar 2008). Women's contribution to the agricultural labor force in developed countries is 37% while, it is about 44% in developing countries. In rural areas women's participation rate in agricultural and livestock management activities is high as compared to that of men.

More details regarding the participation of women in animal production is shown in Table 6.30. It is easily realized that women participate in all activities of animal production. In the animal-based group, women were mainly responsible for feeding animals, cutting grass for fish and attending extension classes. The role of women in decision-making regarding stock, feed selection, vaccination, disease treatment and selling was similar to that of men because those activities required more knowledge and skills than other activities.

Table 6.30. Participation of women in animal production

Unit: Percentage

Activities	Animal-based group	Non animal-based group
Stock and feed selection	42	75
Extension classes	61	75
Vaccination and disease treatment	45	65
Feeding animals	85	90
Cutting grass for fish	70	75
Selling decision	45	65

Source: Household survey, 2011

Obviously, women played a dominant role in livestock production and management activities (Bokhari 2002). Women's participation in the decision-making process not only varied from region to region but also from activity to activity (Tipilda and Panhwar 2008). Pakistani women played a leading role in the livestock sector. They were responsible for 60% to 80% of the feeding and milking of cows. They took responsibility for cutting fodder, cleaning sheds, milking dairy animals, processing animal products and seeing to the health of the herd. Livestock management was considered to be the sole responsibility of women

In rural areas, the rate of women's participation in agricultural and livestock management activities is high as compared to men. They get up early in the morning and continuously work till night. A rural woman in Punjab worked almost 15 hours a day, spending about 5-6 hours caring for livestock. They were responsible for 60% to 80% of the feeding of cattle and milking cows. They remained busy with activities such as cutting fodder, cleaning sheds, milking dairy animals, processing animal products and seeing to the health of the herd. Despite their crucial role in livestock sector, their involvement in decision-making regarding livestock management remains questionable (Tipilda, A. and K. Panhwar, 2008).

**Box 6.4. Livestock production important for women,
especially for women over 35 years old**

In my village, most of the young people work for companies, particularly females aged between 18 and 30. They do different jobs, including confectionary production and packaging. Most are garment workers. From Monday to Saturday, they leave at 6 a.m. and come back home at 7 p.m. Many young women have to send their children to their grandparents. Their eldest child goes to school the whole day and the younger one stays with its grandparents from early morning until evening when their parents come to pick them up and take them back home. This affects the education of their children. The working parent does not have much time to do housework and care for children. I am 38 years old. At my age, I am a bit old to be a factory worker. The best choice for me is to stay right on the farm and work there. I would like to develop livestock production because rice production is not very profitable. However, livestock production suffers from some constraints, such as disease and fluctuation of output price. It also requires the availability of capital for investment.

Source: In-depth interview with farmer, 2011

According to Abedulla et al. (2009), unemployed and untrained rural laborers in the livestock sector can be absorbed by expanding its scale of production through a good credit supply and by improving its efficiency through the allocation of extra labor. A good credit supply enhances the income of livestock growers. It is clearly defining the role of credit in livestock sector. It not only helps to expand economies of scale but also helps to increase the productivity of the livestock sector using the resources available. Hence, expansion of the livestock sector could help to absorb unemployed and untrained rural laborers at their doorstep, which could help to mitigate the migration process of untrained rural laborers towards cities.

CONCLUSIONS AND IMPLICATIONS

Motivated by the need to improve credit access and increase the income of animal producers, this study was conducted in Hai Duong Province. This study attempts to provide both quantitative and qualitative analysis results for a better understanding of access to credit for animal production, the influence of credit and non-credit factors on animal production. This part aims to present some main findings and conclusions to answer the research questions and to verify the research hypotheses. In addition, some policy implications also are suggested to improve access to credit by animal producers and to increase income from animal production.

Main findings and conclusions

Resulting from the empirical analysis, some findings and conclusions associated with the research questions are presented as follows:

✓ Access to credit by animal producing households and relevant factors

The surveyed households, including the animal-based group and the non animal-based group, need credit for both production and consumption. However, the credit supply from the formal sector did not meet the credit needs of animal producers in Hai Duong Province. The farmers still depended on the informal sector. The formal sector mainly provided credit for production and business, while the informal sector mainly supplied credit for urgent consumption needs. In addition, the interest rates of loans supplied by the formal sector were lower compared to that supplied by informal moneylenders. Therefore, many farmers prefer to obtain credit from the formal sector.

The animal-based group borrowed a larger amount of money from the formal credit sector than the non-animal based group. The animal-based group took out 31.9 mil.VND, 8.5 mil.VND and 25.5 mil.VND per household in loans from VBARD, VBSP and PCFs, respectively. The non animal-based group borrowed 18.8 mil.VND, 8.3 mil.VND and 24.5 mil.VND per household from VBARD, VBSP and PCFs, respectively. 77% of borrowers in the animal-based group were supplied by formal credit sources, whereas 52% of borrowers in the non animal-based group were provided by such sources. The non animal-based group depended more on informal lenders. 23% of households in animal-based group borrowed money from informal sources while 48% of households in the non animal-based group received loans from such sources. It should be highlighted that many surveyed households needed more credit to expand their animal production because they were unskilled labors and found it difficult to earn a good income from non-farm jobs. The loan amount received was not only determined by the credit needs of farmers, but also depended on approval from the banks. Therefore, the loan amount received by the surveyed households did not entirely reflect their credit needs.

VBSP mainly provided poor households with credit for education purposes. Therefore, the credit provided by commercial banks (VBARD and PCFs) were important for animal production. In the credit market, access to credit by animal producing households is

determined by both the demand side and supply side. 52% of surveyed households applied to commercial banks for credit whereas despite having credit need, 48% of the surveyed households did not ask to borrow money. Looking at the household characteristics as the center for analysis (area of fish pond, physical collateral and social relationships), this positively affected the probability of credit access by animal producing households. In addition, the area of fish pond, number of family laborers, animal-based income activity and social relationships positively affected the amount borrowed, approved by VBARD and PCFs. Among animal producing households, poor households seemed to have a lower probability of credit access and borrowed smaller amounts than the non-poor households. Concerning the behavior of the formal sector in response to the credit needs of households, the stronger credit needs of farmers were more rationed by VBARD and PCFs.

As mentioned, social relationships also positively affected the credit accessibility of farmers. Here, social relationships can be referred to as a part of the social network. Often participation in a local mass organization created a better social network for farmers, giving them more opportunities to borrow money from VBSP. On the other hand, households who had a close relationship with the staff of local mass organizations or the staff members of commercial banks or the village heads, seemingly were able to gather relevant information on credit programs or to create “trust” to obtain credit. In addition, some weaknesses of the formal sector and staff of mass organizations involved in some steps of the rural credit supply also caused credit access constraints for animal producers. The formal sector allocated limited credit for agricultural production and did not provide sufficient information on the credit supply to farmers. Consequently, credit constrained households occupied 55% of the total number of households in the animal-based group and 82% of the total number of households in the non-animal based group.

In conclusion, the findings confirmed that a large demand for credit by animal producing households exists in Hai Duong Province. Animal producing households faced some credit access constraints, leading to different credit accessibility among households, and were partly influenced by human and physical characteristics, the social relationships of the households and weaknesses of the formal sector.

✓ **Weakness in implementation of VBARD’s no collateral requirement credit program**

Decision No. 67/1999/QD-TTg permitted VBARD to provide loans of less than 10 mil.VND without requiring physical collateral. Such loans did not show good performance in the study communes. In reality, many farmers reported that they had to mortgage their land use certificates to borrow money from VBARD. In Hai Duong Province, VBARD is likely very concerned about loan repayment by farmers. Consequently, the government’s favorable credit program that aimed to enable farmers who lacked collateral to have easy access to credit was not implemented efficiently. Furthermore, recently the Vietnamese government introduced Decision No. 41/2010/ND-CP dated 2010 on the credit policies for agriculture and rural development, which permitted VBARD to provide loans of less than 50 mil.VND to household without requiring physical collateral. By late 2011, it was found that the local authorities and staff of mass organizations in the study communes had not received any information on Decision No. 41/2010/ND-CP. This credit policy was likely implemented very late in Hai Duong Province.

In conclusion, with regard to the credit policy, Decision No. 67/1999/QD-TTg theoretically shows an ambition of the government for improvement of the credit supply in rural areas. Practically, it did not work well on the study sites; it was not up to the government's expectations. The weakness of implementation of Decision No. 67/1999/QD-TTg in Hai Duong Province indicates that in the coming years, the implementation of Decision No. 41/2010/ND-CP will likely be a challenge for VBARD there as well. The farmers could have benefited from Decision No. 41/2010/ND-CP since the opportunity to provide much input on the part of VBARD, the local authorities and staff of local mass organizations has been created.

✓ **Influence of credit and non-credit factors on animal production**

In recent years, it was found that animal disease, substantial increases in feed prices, credit access constraints, high volatility of output prices, limited access to relevant market information and weak bargaining power of farmers and lack of guidance for feed selection were main constraints to production and marketing of the animal producing households in Hai Duong Province.

The cost and return analysis was used to compare economic return from animal production between the non-credit constrained group and the credit-constrained group. In the animal-based group, the return to family labor of the non-credit constrained households was 4,210,000 VND per 100 birds of chicken, 915,000 VND per 100 kg of pig live weight and 2,920,000 VND per *sao* of fish pond while that of the credit constrained group was 2,639,000 VND per 100 birds of chicken, 739,000 VND per 100 kg of pig live weight and 2,507,000 VND per *sao* of fish pond. In brief, in the animal-based group, given the same production unit, the economic return from animal production of the non-credit constrained group was higher than that of the credit constrained group. A similar finding was made for the non animal-based group. It implies that without the credit access constraint, farmers could receive a higher income from their animal production. In other words, better credit access by farmers had a positive influence on their animal production income.

In addition, an assessment of the influence of credit and non-credit factors on the lower return on family labor were separately done for each credit constrained group (in the animal-based group and in the non animal-based group). In the credit constrained group, households were classified in subgroups, based on the credit gap ratio (presented as the level of credit constraints). It was found that the non-credit factors similarly entailed a reduction in income of the households. The households with the higher credit gap ratio had a lower income than the households with the lower credit gap ratio.

In conclusion, the findings indicate that the animal-based group and the non animal-based group were influenced by both credit and non-credit factors. Within each group, the non-credit factors had a relatively similar influence on animal production income. Credit accessibility differed among households. As a result, given the production unit, the credit constrained group generated less income than the non-credit constrained group. In other words, better credit accessibility enabled the animal producer to invest a higher amount in variable production inputs and finally generated higher income from animal production. The improvement in both the credit supply and some non-credit factors helped increase the income from animal production.

✓ **Low income of credit constrained households**

The credit constrained households (71%) occupied a high proportion in the total of households surveyed. The monthly income per capita of the credit constrained households was relatively lower than that of the non-credit constrained households. Within the animal-based group, the monthly income per capita was 2,070,000 VND for the non-credit constrained households and 1,360,000 VND for the credit constrained households. Similarly, within the non animal-based group, the monthly income per capita was 1,510,000 VND for the non-credit constrained households and 920,000 VND for the credit constrained households. Notably, the credit constrained households with a very low monthly income (less than 1,000,000 VND), occupied about 46% of the total households surveyed.

As mentioned, the cost and return analysis showed that given the production unit, the non-credit constrained households generated a higher income compared to the credit constrained households. Since animal production contributed an important share of the total income of households (63% for the animal-based group and 21% for the non animal-based group), better credit accessibility allows the credit constrained households to expand the animal herd size and increase the economic efficiency of animal production. The industrialization process in the Red River Delta region has created non-farm jobs for rural laborers. However, non-farm jobs cannot absorb all the available rural laborers, many of whom have a small area of agricultural land or who have lost their land (Dien 2011). In the light of all the mentioned evidences, the study concludes that improving the credit supply to animal production can be considered as one of the possible solutions to increase income for the credit constrained households in Hai Duong Province.

Verifying the research hypothesizes, the study concretely confirmed that animal producers in Hai Duong Province faced credit access constraints. Credit accessibility was partly influenced by the human and physical capital and social characteristics of households. In addition, animal production was influenced not only by the credit accessibility of farmers but also by some non-credit factors. Although credit is important to promote animal production, it is very necessary to enhance the credit supply and to improve some non-credit factors to generate a stable income from animal production. This, in turn will enable farmers to have better access to credit.

Implications

Implications for policymakers

✓ **Strengthening the credit supply from the formal sector**

For VBARD, information on the credit program without a collateral requirement should be effectively conveyed to farmers. The lending network between VBARD and mass organizations should be strengthened. In the coming years, it is important for VBARD to implement Decree No. 41/2010/ND-CP effectively. Furthermore, VBARD also needs to enhance its role in the agricultural credit supply and increase the availability of lending capital to meet the credit needs of farmers. With transaction offices located in communes, PCFs should have more competitive strategies to increase their outreach to animal producers. In addition, VBSP's credit program for agricultural production should be expanded to take on the poor. Better monitoring of VBSP's credit supply targeted to the poor is also recommended.

✓ **Credit for input vouchers of animal producer groups**

Besides improving the credit supply to individual borrowers, credit for input vouchers of animal producer groups is suggested for the formal sector in Hai Duong Province in particular and in Vietnam in general. Animal producer groups, banks and animal feed factories should work together. The animal producers collaborate together within the group and thus take advantage of economies of scale and ensure a stable input supply for cooperative members. The study suggests that VBARD should supply the credit for input vouchers. The feed factories sell animal feed to the animal producer group without cash payment. Then, the animal producer groups submit their vouchers for feed purchased to VBARD for to get credit. Finally, VBARD transfers money to the feed factories.

The credit for input vouchers enables farmers to have easy access to credit, reduces their cost of feed purchasing and purchase feed at a cheaper price. It also enables VBARD to monitor the credit use of farmers more easily and reduces the bank's operational costs. The credit for input vouchers can be seen as an appropriate way to improve animal production because farmers who lack cash cannot purchase feed by deferred payment from the feed factories. VBARD having been assigned the responsibility for the credit supply to the agricultural sector should put forth more effort to supply credit for input vouchers to animal producer groups.

✓ **Capacity building of animal producers**

As the result of study showed, the household human capital influenced the lending decision of VBARD and PCFs. Household heads with a higher level of education had better access to credit from the banks mentioned. In addition, the social relationship of animal producers was also an important affecting their credit accessibility. This study suggests that farmers should give much attention to improving their education. As members of local mass organizations, farmers should participate more actively in those organizations to strengthen their social relationships. Furthermore, farmer awareness of disease prevention and treatment must be raised.

✓ **Strengthening the veterinary network and extension services**

The veterinary network and extension services should be enhanced to reduce the risks in animal production. Disease detection, surveillance and control by the veterinary network should be strengthened to limit outbreaks of animal disease. The smuggling of livestock from China must be eliminated. This will contribute to reducing disease outbreaks and the volatility of livestock output prices. In addition, training in disease prevention for farmers should be given in a more timely and efficient manner. Training courses in fish production should also be offered. Importantly, the extension services should not provide overly technical training. Non-technical knowledge (on marketing and collective action linkages) should be supplied through the extension services.

✓ **Establishment of animal producer groups (collective action)**

As mentioned, the surveyed households faced credit access constraints and non-credit constraints, which related to both production and marketing. Regarding some constraints, the low bargaining power of the individual farmer, limited access to relevant market information and high cost of purchasing feed were partly caused by a lack of linkage among farmers and a lack of linkage between farmers and market actors. In other words, on the study sites, most of the animal producing households operated individually with regard to animal production and market access. Smallholders isolated outside of groups had limited capacity for investment and marketing. Limited access to credit and market information and the vulnerability to risk of farmers condemn them to remain marginal and poor. The result analysis in Chapter 6 indicated that the animal producing households on the study site faced many constraints of production and marketing, partly caused by each one working individually. The success of the collective action for pig production in Nam Sach district in Hai Duong Province (Lapar et al. 2006) and for some agricultural products in other provinces of Vietnam create an idea for animal production development on the study site. It is suggested that the local authorities in Hai Duong Province support small animal producers to establish animal producer groups, based on the collective approach. The linkage within farmers, and linkage between farmer groups and other stakeholders (banks, input suppliers, extension institutions and other market actors) could provide more extensive opportunities for increasing farmer incomes. The collective production process is a vital factor because it allows the members to produce the same kinds of animal products of uniform quality to meet the market demand. The collective process also facilitates the collective buying of inputs at lower prices and leads to collective product selling. On the other hand, in the framework of collective action, the farmer group is entrusted with agricultural extension activities that will foster rapid technology transfer. In addition, linkage among members helps them access credit more easily at a low cost. Concisely, the collective action of animal producer groups could reduce the transaction costs of input procurements, overcome other barriers to market participation, make farmers more able to access credit and increase their income.

Implications for further research

Agricultural finance continues to be considered as an important research issue to promote agricultural production in Vietnam, especially the livestock sector. Financing of the livestock value chain is suggested as a subject for further research. All indications are that such could be very useful for promoting livestock production.

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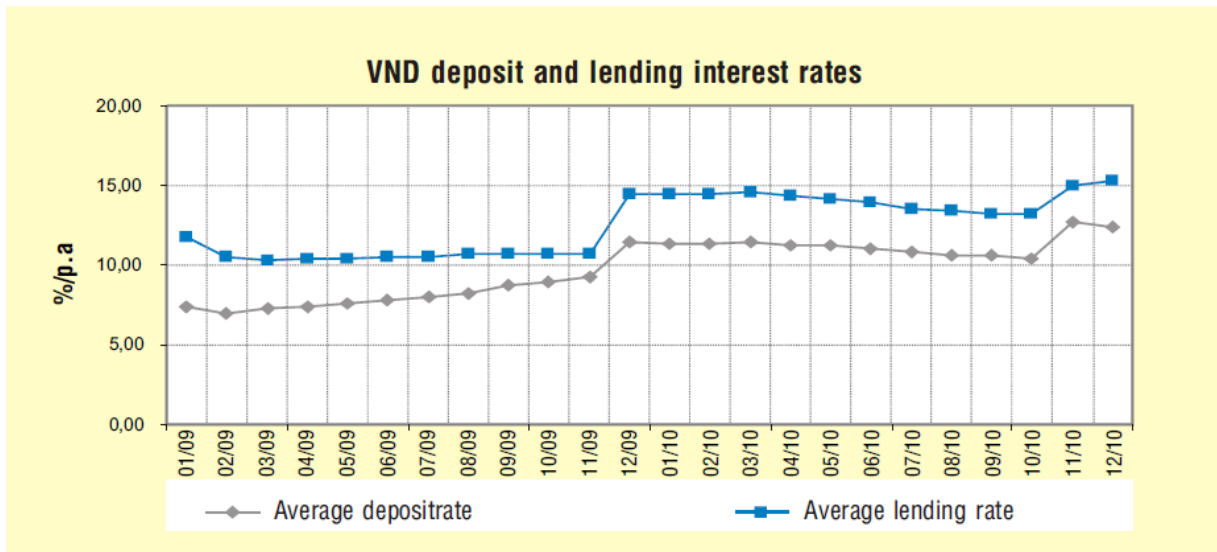
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APPENDIXES

Appendix 1. VND deposit and lending interest rates in 2009 and 2010 in the economy



Source: State Bank of Vietnam (2010).

Appendix 2. Household characteristics of group of applying credit and group of non applying credit

Indicators	Unit	Group of applying credit n= 76		Group of non applying credit n= 69		P values
		Mean	S.D.	Mean	S.D.	
Age of household head	Years of age	45.0	7.8	46.0	9.4	0.37
Education of household head	Years of schooling	7.4	1.2	7.0	1.1	0.11*
Family size	Persons	4.7	1.0	4.4	0.8	0.20
Number of workers	Persons	2.6	0.8	2.2	0.7	0.05**
Dependency ratio		0.43	0.1	0.49	0.1	0.01***
Area of crop land	1,000 m ²	2.6	1.2	2.2	7.6	0.00***
Area of fish pond	1,000 m ²	3.6	2.4	1.2	0.8	0.00***
Size of poultry flock	Birds/year	212.0	96.0	187	65	0.00***
Size of fatling pig head	Head/year	20.0	12.0	10.0	8.0	0.00***

Source: Household survey, 2011.

Appendix 3. Test for Probit regression – Solution 1

Solution 1

*Probit estimation; n= 145,
LRchi2(12) = 102.39, Probi>chi2= 0.000 and Pseudo R² = 0.5102*

Variables	Coefficients	Z - statistic¹	P values
AGE	0.018	0.83	0.409
EDUCATION*	0.239	1.66	0.097
GROUP***	- 1.162	- 3.05	0.002
LABOR	0.379	1.17	0.241
DEPENDENCY	0.564	0.33	0.741
CROPAREA**	0.382	2.19	0.028
PONDAREA***	0.045	2.47	0.014
ACTIVITY	0.365	0.71	0.479
CHICKEN	- 0.199 ⁺	- 1.04	0.297
PIG	- 0.006 ⁺	- 0.38	0.702
RELATION**	1.099	2.22	0.026
COLLATERAL*	1.163	1.57	0.115
Constant	- 5.672	- 2.41	0.016

Source: Estimation from household survey data, 2011.

Note: *** and ** significant levels at 1% and 5 %, respectively; ¹ The Z-statistic is the ratio of the coefficient to the standard ratio. DEPENDENCY: Dependency ratio; CHICKEN: Number of chicken heads; PIG: Number of pig head; ⁺ unexpected sign of coefficients.

Appendix 4. Test for Probit regression – Solution 2

Solution 2

*Probit estimation; n= 145,
LRchi2(12) = 101.14, Probi>chi2= 0.000 and Pseudo R² = 0.5040*

Variables	Coefficients	Z - statistic¹	P values
AGE	0.133	0.63	0.527
EDUCATION*	0.214	1.57	0.110
GROUP**	-1.000	- 2.96	0.003
LABOR	0.356	1.12	0.265
DEPENDENCY	0.253	0.15	0.878
CROPAREA**	0.381	2.12	0.027
PONDAREA**	0.044	2.14	0.016
ACTIVITY	0.260	0.56	0.576
RELATION*	1.002	2.09	0.036
COLLATERAL*	1.111	1.55	0.121
Constant	-5.475	- 2.37	0.018

Source: Estimation from household survey data, 2011.

Note: *** and ** significant levels at 1% and 5 %, respectively;

¹ The Z-statistic is the ratio of the coefficient to the standard ratio.

Appendix 5. Factors affecting the borrowing amounts by animal producing households
(Linear- Logarithm regression equation)

Variables	Coefficients	t - statistics
Ln(AGE)	-8.585	-138
Ln(EDUCATION)	3.886	0.65
Ln (LABOR)	11.145	3.10***
GROUP	-16.642	- 4.99***
ACTIVITY	5.392	2.26**
RELATION	6.594	3.18***
Ln(PONDAREA)	0.825	2.35**
Mill ratio	0.286	6.09***
Constant	16.344	0.54***

Source: Estimation from data of household survey, 2011.

Note: LINEAR (Borrowing amount) = LOGARITHM (Household characteristic variables+ Mill ratio);

n= 61 and Adj R- squared = 0.578;

***, ** and * are significant levels at 1%, 5 % and 10%, respectively.

Appendix 6. Factors affecting the borrowing amounts by animal producing households
(Linear- Linear regression equation)

Variables	Coefficients	t - statistics
AGE	- 0.148	-1.07
EDUCATION	0.953	1.13
LABOR	3.297	2.85***
GROUP	-16.580	- 5.13***
ACTIVITY	5.243	2.38**
RELATION	5.020	2.50***
PONDAREA	0.117	2.93***
Mill ratio	0.269	6.19***
Constant	-7.683	- 0.66

Source: Estimation from data of household survey, 2011.

Note: LINEAR (Borrowing amount) = LINEAR (Household characteristic variables+ Mill ratio)

n= 61 and Adj R- squared = 0.578

***, ** and * are significant levels at 1%, 5 % and 10%, respectively.

Appendix 7. Reasons of treatment implementation for pig by farmer themselves

Unit: Percentage

Reasons	Animal-based group	Non animal-based group
Having experience for disease treatment	52	38
Take time to wait for veterinarians	8	16
Do not believe private veterinarians	15	10
Increasing cost of disease treatment	24	36
Total	100	100

Source: Household survey, 2011.

Appendix 8. Purchasing breeding sources of surveyed households

Unit: Percentage

Sources	Animal-based group	Non animal-based group
Poultry	100	100
- Market at the commune	30.3	47.5
- Farm gate of small breeding producers	18.7	10.2
- Breeding dealers	28.0	20.0
-Self-production on farm households	6.0	14.3
-Retailers of poultry breed companies	17	8.0
Pig	100	100
- Market at the commune	5.0	10.0
-Farm gate of small breeding producers	40.5	20.3
- Breeding dealers	29.0	54.7
- Self-production on farm households	25.5	15.0
Fish	100	100
-Farm gate of small breeding producers	30.7	22.0
- Breeding dealers	60.8	78.0
-Self-production on farm households	8.5	0.0

Source: Household survey, 2011.

Appendix 9. Some additional information on chicken and pig production

Indicators	Animal-based group		Non animal-based group	
	Subgroup 1A	Subgroup 1B	Subgroup 2A	Subgroup 2B
	Non- credit constrained	Credit constrained	Non-credit constrained	Credit constrained
Purchasing price of concentrate feed (1,000s VND/kg)	9.6	10.2	10.0	10.5
Yield (kg/head)	2.3	1.9	2.0	1.9
Selling price of chicken (1,000s VND/kg)	60	59	56.8	56.5
Purchasing price of complete pig feed (1,000s VND/kg)	8.8	9.8	9.2	10
Yield of live weight (kg/head)	114	100	98	78
Selling price of live weight (1,000s VND/kg)	47.5	41.0	39.5	38.0

Source: Household survey, 2011.

Appendix 10. Classification of subgroups by animal production type for animal-based group

Num. of households involving	Subgroup 1B			Total
	Subgroup 1B (a)	Subgroup 1B (b)	Subgroup 1B (c)	
Chicken production	7	10	15	32
Fatling pig production	7	10	14	31
Fish production	7	10	15	32

Source: Household survey, 2011

Appendix 11. Classification of subgroups by animal production type for non animal-based group

Num. of households involving	Subgroup 2B			Total
	Subgroup 2B (a)	Subgroup 2B (b)	Subgroup 2B (c)	
Chicken production	15	20	37	72
Fatling pig production	9	11	13	33
Fish production	5	6	9	20

Source: Household survey, 2011.

Appendix 12. HOUSEHOLD QUESTIONNAIRE (First round)

Name enumerator:.....
Date of interview:.....
Data checked
Comment.....

I. General information

1. Information on respondent

District and code of district		Commune and Code of commune	
Village and code of village		Code of household	
Name of household head			

2. Household characteristics

	Name	Relation to respondent (Code 1)	Sex (Code 2)	Age	Year of Education	Health situation (Code 3)	Occupation	Monthly Income
1								
2								
3								
4								
5								
6								

Code 1

- 1. Household head
- 2. Husband/Wife
- 3. Child
- 4. Grand child
- 5. Other

Code 2

- 1. Male
- 2. Female

Code 3

- 1. Good
- 2. Ok
- 3. Ofent ilness
- 4. Others (Specific)

3. Household group

	Household group 1. Poor; 2.Non- poor	If your family is clasified as the poor group, did your family to be provided the certificate of poor households? 1= Yes; 2=No	Note
2006			
2007			
2008			
2009			
2010			

4. Resident area and Housing

	Area (Sao)	Year of construction	Current estimated value of housing (Million VND)	Having land use right certificate of resident area? If no, why?
Resident area		-	-	
Housing	-			-

If the resident are is used as the physical collateral to borrow money from the bank, how much you could borrow from the bank?

5. Durable assets and equipments

	Quantity	Purchasing price (Million VND)	Current estimated value (Million VND)	Note
Motorbike				
Television				
Fridge				
Gas cooker				
Telephone				
Truck				
Water pump				
Other				
TOTAL				

6. Garden, agricultural land and pond area

	Area (Sao)	Land use certificate 1. Yes; 2. No	Yearly payment of land use (Million VND)	Note
1. Garden				
2. Current cultivated area of rice land				
Allocated land				
<i>Of which, renting out area</i>				
Renting in area		-		
Borrowing area		-		
3. Current cultivated cash crop land				
4. Current cultivated area of pond				

II. Access to credit

1. Formal sources

1. Do you know following financial institutions? How do you know?

	1. Yes 2. No	How do you know?
VBSP		
VBARD		
PCFs		

2. In 2010, did you apply form to borrow money from VBSP/ VBARD / PCFs?

1. Yes
2. No

3. In 2010, why did you not apply from to borrow money?

Reasons	VBSP	VBARD	PCFs	Note
1. Did not apply because no need, enough own money				
2. Did not apply because do not know to invest for production				
3. Did not apply because afraid of not being able of paying back the loan				
4. Did not apply because of lacking of physical collecteral				
5. Did not apply to borrow because easily borrow from informal sources				
6. Wanted to borrow but did not apply because I felt that I would be rejected (because of my health, age, never borrowed before...)				
7. Wanted to borrow but did not apply because of too complicated procedure				
8. Wanted to borrow but did not apply because of high interest rate				
9. Wanted to borrow but did not belong to the targeted group of VBSP				
10. Others (specific)				

4. Since 2008, how did your household borrow money from VBSP, VBARD and PCFs?

	VBSP		VBARD		PCFs		
	Applied form 1. Yes 2. No	Result 1. Accepted 2. Rejected	Applied form 1. Yes 2. No	Result 1. Accepted 2. Rejected	Applied form 1. Yes 2. No	Result 1. Accepted 2. Rejected	
2010							
2009							
2008							

5. Could you indicate why your borrowing proposal was rejected ? (Multiple choices may occur simultaneously)

Reasons	2010	2009	2008	Specific sources
1. Planning of loan use did not persuade the bank's staff				
2. Did not know				
3. Others (specifics)				

2. Informal sources

1. In 2010, did you propose to borrow money from your relative people, friends/ money lenders ?

1. Yes
2. No

2. If no, why did you not propose to borrow money from your relative people/ friends/ money lenders?

Reasons	Note
1. Did not apply because no need, enough own money	
2. Did not apply because do not know to invest for production	
3. Did not apply because afraid of not being able of paying back the loan	
4. Wanted to borrow but did not apply because I felt that I would be rejected (because of my health, age,...)	
5. Wanted to borrow but did not propose because of high interest rate	
6. Others	

3. Why you was rejected to provide loan?

	Reasons
1. Credit suppliers were afraid of your repayment of loan	
2. Relative people or friend did not have money for lending	
2. Did not know	
3. Others (specific)	

3. Borrowing amount in 2010

Sources	Loan number	Date and month of borrowing	Loan terms (month)	Monthly Interest rate (%)	Proposed amount of borrowing (Million VND)	Received amount of borrowing (Million VND)	Physical collateral (what?)	Transaction costs (Million VND)
VBSPC	1							
	2							
	3							
VBARD	1							
	2							
PCFs	1							
	2							
	3							
Relative people	1							
	2							
Friends	1							
	2							
Money lenders	1							
	2							

4. Loan use and repayments in 2010

Sources	Loan number	Loan use as borrowing proposal <u>Code 1</u>	Actual use of loan		Repayment		Source of money for loan repayment	
			Percentage (%)	Activity <u>Code 2</u>	Amount (Million VND)	Date/ Month	Percentage (%)	Source <u>Code 3</u>
VBSPC	1							
	2							
	3							
VBARD	1							
	2							
PCFs	1							
	2							
	3							
Relative people	1							
	2							
Friends	1							
	2							
Money lenders	1							
	2							

Code 1,2

1. Purchase of animal breed
2. Purchase of feed
3. Upgrading of animal shelter
4. Purchase of farming equipment
5. Running small business
6. School fee
7. Medical fee
8. Weeding or funerals
9. Repayment for old debt
10. Others

Code 3

1. Selling animal
2. Selling crop product
3. Trading
4. Non-farm income
5. Others

5. Credit need

1. Generally, every year which time do you need credit? For what?

Month	Credit need for what?	Note
January		
February		
Mach		
April		
May		
June		
July		
August		
September		
October		
November		
December		

2. Your assessments for credit supply sources

Sources	Advantages	Disadvantages
VBSP		
VBARD		
PCFs		
Friends and relative people		
Money lenders		

3. In 2010, did you use deferred payment for your feed or fertilizer purchase? Advantages and disadvantages of the deferred payment? Comparison between credit use for feed/ fertilizer purchase and the deferred payment for feed and fertilizer purchase.

	Maximum amount (Million VND)	Average amount (Million VND)	Average time (Months)	Note
Fertilizer				
Feed				

4. If your relative people give you a following amount of money, how do you use it?

Amount of money (Million VND)	Use for what?
3	
6	
9	
12	

5. Please indicate your credit need for equipment investment? Pond fish and shelter upgrading?

III. Crop production, selling and consumption

1. Crop production

	Rice	Vegetable	Water melon	Spicy	Others
Area (Sao)					
Yield (kg/sao)					
Total productivity (kg)					
Selling price (1000 VND/kg)					
Production cost (1000 VND/sao)					
<i>Breeding</i>					
<i>Fertilize</i>					
<i>Pesticide</i>					
<i>Herbicide</i>					
<i>Land preparation</i>					
<i>Irrigation fee</i>					
<i>Harvesting</i>					
<i>Land renting cost</i>					
<i>Other costs</i>					

2. Use of crop product

	Total productivity (kg)	Gross output at market value (Million VND)	Household consumption (%)	Use as animal feed (%)	Selling (%)	
Rice						
Other crops						
Total						

IV. Animal production and selling

1. Why do you engaged in animal production?

Reasons	Yes
Food for household consumption and an increasing income	
Effective use of family labor	
Keeping a fish pond	
Lack of skill for finding a good job	
Saving	
Use of crop residual	
Manure for crop production	
Others (specific)	

2. Information on production and selling price

	No of raised head	No of loosed head	Total area of fish pond (Sao)	Average weigh per head (kg)	Selling price per kg (1000 VND)	Total gross output (1000 VND)	
Breeding pig			-	-	-		
Fattening pig			-				
Chicken			-				
Other poultry			-				
Fish	-	-					

3. Cost of production

	Cost (1000 VND), excluded interest payment					Other
	Breeding	Feed	Vaccination and veterinary	Electricity	Depreciation	
Breeding pig (for 1 head)						
Fattening pig (for 1 head)						
Chicken (for 100 head)						
Other poultry (for 100 head)						
Fish (for 1 sao)						

4. Allocation of interest payment

	Gross output (1000 VND)	Estimated profit (1000 VND)	Allocation of interest payment (based on estimated profit) (1000 VND)
Breeding pig			
Fattening pig			
Chicken			
Other poultry			
Fish			

5. Comparison between available cash, borrowing amount for animal production and needed cash amount

With current raised heads and fish pond area, could you indicate for some following information?

	Unit	Value
Available cash for all kinds of animal production	1000 VND	
Borrowing amount for animal production cost	1000 VND	
Total needed cash to fulfill the input purchasing for optimal yield	1000 VND	
Total needed cash for current production / (Available cash + Borrowing amount)	%	

Influence of credit to animal productivity

	Yes/No
Low investment in feed	
Low investment in disease prevention	
Low investment in breed quality	

6. Constraints to animal production and marketing

Constrained	Yes/ No	Detailed information	Reasons
Animal disease			
Input price			
Output price			
Marketing information			

V. Family labor use for animal production

1. Family labor use

	Number
Number of involved workers	
Average number of working day per month	

2. Who mainly spend time for animal production? What activities?

VI. Social network and access to credit

	Family members Code 1	Position Code 2	Relationship with staff of commune or bank Code 3	Role of mass social organization in access to formal credit Code 4
Women's union				
Famer's union				
Youth' union				

Code 1,2,3

1. Yes
2. No

Code 4

1. Very important
2. Important
3. Less importance
4. No

VII. Household expenditure

	Percentage (%)
Expenditure in daily consumption	
Other purpose	
Reinvestment in animal production and fish pond upgrading	
Interest payment	

Appendix 13. HOUSEHOLD QUESTIONNAIRE (Second round)

Name enumerator:.....

Date of interview:.....

Data checked

Sources	Loan number (Borrowed in 2010)	Borrowing Amount (Million VND)	Amount of repayment (Up to 2012)	Main income sources for repayment	Note
VBSPC	1				
	2				
	3				
VBARD	1				
	2				
PCFs	1				
	2				
	3				
Relative people	1				
	2				
Friends	1				
	2				
Money lenders	1				
	2				