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Microanalysis on the Vietnamese Agricultural Structure - Results of the Field Study in Ninh Binh and An Giang Provinces -

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1. Introduction

Since the later half of the 1980s, the reform process known as Doi moi has created significant improvement in agriculture and rural economy. Given supporting policies and programs of Doi moi, agricultural production in Viet Nam had reached an impressive annual growth rate of about 5 % from 1989 to 1998. Food production increase averaged 1.2 million tons per year. The increase has not only ensured food security but also enabled the country to export a large volume of rice. Other commodities aside from rice had similarly experienced positive growth rates.

While Viet Nam's agricultural production has been experiencing a dramatic increase, there is still a prevalent condition of abundant labor force in rural areas. This is the main determinant of low productivity of Vietnamese agriculture, and consequently, of low income of rural households in Viet Nam. Future improvement in agricultural productivity and farm income can only be achieved by focusing attention to the abundant labor problem. With the end in view of addressing this issue, the study on raising agricultural productivity and farm income has been conducted jointly between Vietnamese and Japanese researchers. Many subtopics are listed in the research on agriculture and rural development in the framework of the Phase 3 of the project. Among other things, a comprehensive field survey at grassroots levels has particularly been important, since from the survey we could obtain vital information on Vietnamese rural economy.

The aim of this report is to present the results of the field survey with the intention of offering basic data and information on changes in agricultural/rural structure at village level. In this report, many cross tables compiled from household questionnaires as well as commune inquirers are offered. Moreover, information on the rural economy collected at provincial levels, and data on agriculture related institutions such as rural financial institutions and mass organizations, are provided.

2. Sampling process and the design of questionnaire

2.1 Sampling process

Since the principal aim of this study is to grasp the agricultural/rural structure and its changing, it is desirable to have a field survey comparable to a similar household survey conducted previously. Fortunately, we had the field survey in Phase 2 of this MPI and JICA joint research project. In January 1997, the Vietnamese research team and Japanese consultants carried out the survey in three provinces, representing three main regions of Viet Nam: Ninh Binh (North), Quang Ngai (Center) and An Giang (South). In each province, two representative villages were randomly drawn, in which 50 households were interviewed for each village. The households' sample again had been randomly selected.

We decided to repeat the survey selecting exactly same samples in order to utilize available data to trace changes occurring over three years. Those observations in Quang Ngai province, however, were excluded

from this current sample because the province did suffer seriously from the heavy flood in 1999, and hence it would not be comparable to assess the mobility of the agricultural structure throughout the time.

It is worth noting in advance that comparisons cannot be completely done due to the difference in purposes between the two studies. The basic purpose of the 1997 survey was to catch the financial activities of rural households, while that of the 2000 survey was to grasp the change in agricultural/rural structure.

In addition to the rural household survey, a commune survey was conducted for the two communes in each province, where the households surveyed were belonging. We also visited several local authorities in different levels, agriculture related institutions like branch offices of Viet Nam Bank for Agriculture and Rural Development (VBA), agricultural cooperatives, and mass organizations. As will be pointed out later, these institutions and organizations play important roles in spurring economic development in rural areas.

Prior to the main survey, testing (preliminary) survey was undertaken in two provinces in February 2000. After checking the relevance of the questionnaire, main survey was conducted in May with the assistance of Vietnamese experts.

2.2 The design of questionnaire

The main objectives of this study are: (1) Study the development of the Vietnamese agriculture since the mid-90's, (2) Change in agricultural structure especially of the distribution of operating farming size, and productivity difference among farm households, (3) Change in composition of farm household income from agricultural and off-farm sources, (4) Mobility of farm land. Given these objectives, the questionnaire was designed as follows. The household survey questionnaire consists four main parts. Part 1 addresses general information on household, in which some crucial items were asked. Part 2 mentions about the factors used in production and its changes. In this part, there are two subsets of questions. The first set examines production cost of major three agricultural activities including rice production and livestock raising. The other activity is left open depending on the farm situation in each area. The second set of the part 2 surveyed the factors used and their changes between 1996 and 1999. Land and capital use as well as cropping pattern were asked. It should be noted that the movement of labor had been addressed in the part 1. The third part consists of questions on sources of income and household production. For this part, the questions are almost similar to those of the 1997 survey. The last part has been designed with the intention to identify factors contributing to agricultural production changes. Such factors as the favorable policy environment, technology adoption, market conditions, and availability of rural finance are examined. The questionnaire was principally designed with the intention to compare as much as possible the situation between 1999 and 1996.

A panel household survey data is obtained consisting of cross-section data of households at two study periods, namely 1996 and 1999, although, as previously mentioned, not all items are identical. In this study, attempts are concentrated on examining the current (1999) agricultural structure and then comparing

with the 1996 situation based on household data. Before doing so, however, we will brief the socio-economic situation of the two surveyed provinces. Furthermore, observations from interviewing officers, organizations will be incorporated in the study. In addition, results of other relevant studies are utilized in this study as well.

3. Socio-economic situation of surveyed areas

3.1 Socio-economic situation of surveyed provinces

Ninh Binh is somehow a typical province of the Red River Delta (RRD) of the North. It is located in South of Hanoi, the capital of the country, and is about 80 km from. The eastern side of the province is bounded by the South China Sea. It contains a large area of unexploited wetland, which is conducive for aquaculture development.

Table 3.1 exhibits that majority of the Ninh Binh inhabitants live in rural areas, accounting for 86% of its total population in 1998. The share of agricultural laborers, including forestry and fishery in total, was 78% in 1998. It is interesting to see that the proposition of rural population and of agricultural labors in total has been declining although at a slow rate. The number of industry producing households is increasing somewhat and it reached 11,818 households in 1998. Agricultural as well as paddy land, and average agricultural land per labour is quite stable. It should be noted, however, that the province still has a large area of unused land, which would be able to bring into play if having appropriate investment. All these basic indicators initially suggest that the rural economy of the province is primarily based on agriculture.

The Ninh Binh economy has fairly developed comparable to the national level. The GDP of the province increases significantly (Table 3.2). Agriculture still plays a relatively important role, with its GDP share accounting for 52% in total in 1998. Agriculture's share in GDP had been fluctuating over time with decreases in 1996 and 1997 and followed by a big increase in 1998. The fluctuation is attributed mainly to the fluctuation in cultivation, which composes 79% of total agricultural GDP in 1998 compared 74% to in 1995. Consequently, the share of livestock decreased accordingly. Agricultural services are quite stationary in terms of growth and accounted for the very negligible proportion of 0.8% reflecting the underdevelopment of this sub-sector.

It has been found that rice cultivation was the leading sector in cultivation as well as in the agricultural sector but its share was not stable. The share jumped into 72% in 1998, while that in 1996 was just 60%. Statistical data shows that it is not necessarily the up-going trend since other crops other than rice are expanding in terms of both areas and output. The key point, however, is that rice yield has been increasing dramatically about 1.3 times even though the cultivated areas is almost stable (Table 3.3). Thus the increase in rice output is mainly attributed to technological change in which the adoption of new varieties and an intensive application of fertilizer are the leading explanatory factors.

The adoption of high yielding rice varieties led to a dramatic increase in gross output of rice. It enabled the Ninh Binh province not only to be self-sufficient but also to export as well about 8,000 tons of rice. In 1999, hybrid rice accounted for 48% of total in Ninh Binh, and due to the shortage of cereals in the international market in 1998 and 1999, even hybrid rice with low quality could be exported. It has not been the case for the year 2000, however, when the price of rice was falling. Although the province is in surplus of rice and in difficulty to sell, it was learned from the interview that farmers would not significantly respond to the falling prices. Hence, rice output would likely remain stable. This inelastic price response phenomenon is understandable for Ninh Binh province as well as for the Red River Delta areas. The average land per capita is small, and rice production here is largely not for sales but for home consumption.

Given the particular circumstance of Ninh Binh the logical option for development of Ninh Binh agriculture is to spur livestock production. Said option must be coupled by a continuing expansion of other crops such as fruits, vegetables, and industrial crops. It is not sufficient, however, to develop the diversification in agricultural production. Entire transformation of rural economy through the development of rural industries and rural services is needed. With respect to economic structure, strengthening the household economy and spurring the development of "farms" is also indispensable. Agricultural mechanization shall continue to play an important role in such transformation as well. These points will be argued again when we look at the household survey data.

The other study province is An Giang. This province is located in the Mekong River Delta (MRD) of Southern Viet Nam. One side of the province borders Cambodia. The province is about 250 km from Ho Chi Minh City, the biggest commercial center of Viet Nam. An Giang has its capital city, namely Long Xuyen, and the town near the Viet Nam-Cambodia border is the Chau Doc town. The recently constructed bridge, My Thuan, has helped to ease transportation between the province and other areas in the region, especially with Ho Chi Minh City.

Table 3.4 shows that cultivated land areas have been remained stable for nearly 15 years in An Giang from 1986 to 1999 due in part to the active reclamation in Dong Thap Muoi areas that overweight areas believed to be converted for other purposes. Agricultural land per capita is 0.303 ha. The figure is considerably higher than the one of Ninh Binh province. With respect to agriculture the province has a comparative advantage in rice cultivation and aquaculture.

Agricultural labour has been declining slightly accounted for 83% and 80% in 1996 and 1998 respectively, while in the service sector labour is gradually increasing. As mentioned in the footnotes of Table 3.5, rural labours, in which 90% is agricultural, account for 81% total working labours and the rest is urban labours, in which again, 20% is agricultural. By and large, most of An Giang population is engaged in agricultural production.

The share of total agriculture, forestry, and fishery in the provincial GDP is declining from 53.6% in 1995 to about 45% in 1999. The composition of agriculture, forestry, and fishery is quite stable with

proportions of 89%, 1.3%, and 10%, respectively. It is worth noting that in agriculture alone, cultivation is fluctuating and accounts for a relatively large proportion. It increased from 67% in 1995 to around 74% in 1999. This consequently led to decreasing shares of livestock and agricultural services and shows decreasing trends in total share (Table 3.6).

Most of the increase in cultivation can be explained by the expansion of sown land areas. Returning to the Table 3.4, it is clearly seen that land using ratio, defined as the ratio of total sown areas over total cultivated areas, is increasing significantly from 1.23 to 2.08. In An Giang province, paddy is cultivated at three croppings per year for some areas. Total sown area has been increasing significantly, which reached 512,406 ha in 1999. Increasing sown area, together with the increase in yield, resulting from improved irrigation and technology adoption is the key factor for the increment of the share of cultivation in the agricultural sector.

It is noteworthy to emphasize the fact that the rice-growing pattern has been changing. Rice is grown in the summer-autumn crop as much as in the spring winter one while the areas to grow monsoon rice is declining dramatically. It is due in part to the high yield of the summer-autumn rice relative to the low one of the monsoon rice. Furthermore, as previously mentioned, because rice price in 1998 was quite high such that the areas of a third crop has been expanded quickly reaching 32,033 ha even at a very high cost (according to an agricultural economist interviewed).

Another important sector is aquaculture. Though this sector currently still accounts for a relatively small proportion in the provincial economy but it is a potential sector for improving household income. It can be considered as the comparative advantage of An Giang province. We interviewed some fish farming households in Chau Doc town and it has been very much impressive to us about their business. It is desirable that authorities provide relevant measures to support the development of this sector such as farming extension, marketing, and so on.

Lastly, in comparisons between the agricultural GDP compositions of the two provinces, the salient point is that agricultural service accounts for an extremely small proportion in Ninh Binh province. In the case of An Giang, it is 10 times higher. It implies that the commercialization process is occurring at a faster pace in An Giang agriculture compared to Ninh Binh.

3.2 Surveyed communes

As already explained, in each province, two communes, in which one is relatively close to the provincial capital and economically developed and the other is far from the urban area and economically underdeveloped, were chosen. Moreover, in each commune, a representative hamlet to the respective commune was selected. In Ninh Binh province, the surveyed communes, namely, Ninh Phong and Ninh Thang, are located in Hoa Lu district. Ninh Phong is about 5 km from the provincial center. Besides farming, rural industries such as furniture making, embroidery, and the like, are quite popular in this

commune. Ninh Thang is around 15 km far from the provincial center. However, the commune is passed through by the road connecting the National way No. 1 and the tourist cluster namely Tam Coc Bich Dong which has attracted many visitors. The low level of damp ground characterizes the commune. Recently, seasonal migrant workers to Ho Chi Minh City have increased. There are also some households doing sideline jobs. In this province the former is assumed to be better off compared to the latter.

With respect to An Giang province, two communes of Chau Thanh district, namely, An Chau and Vinh Binh were selected. Vinh Binh is located far from the Long Xuyen City, the provincial center. Agricultural land is along the Mekong River. Aquaculture has been also developed. In contrast, An Chau is about 9 km from the central province. This commune is a central town of Chau Thanh district. There are existing chances for sideline jobs and non-agricultural activities. Here, the later is supposed to be the economically developed area.

4. Results of the household survey

4.1 Production factors

4.1.1 Agricultural land

Table 4.1 exhibits the situation of landholdings of surveyed households. The notable point is that there is a sharp difference in landholdings per household between two provinces. While in Ninh Binh, farmland per household was about 0.26 ha in 1999, the figure for An Giang was averaging at 1.08 ha per household. Farmland consists mostly of paddy field, thus resulting to small proportion of land grown to other crops. Paddy land per household are 0.24 ha and 1.18 ha in Ninh Binh and An Giang, respectively.

There were only two households in Ninh Binh who have fruit land with average area of 0.03 ha per household. In contrast, the figures were fairly bigger in An Giang province (12 households with an average of 0.41 ha per household). The number of household having pond/cannel areas for aquaculture is quite contrastive between two provinces. With respect to the average size of pond/cannel area per aquaculture household, the figure in An Giang was twice compared to Ninh Binh.

All of the aforementioned analysis indicates that the farming size of Vietnamese households is rather small and diversified among regions. Especially the farming size in Ninh Binh is too small. It, however, is further worsened by the fact that farmland in the RRD is widely dispersed. With an average of only 0.22 ha of farmland, farmers have 6.2 different parcels in Ninh Binh province. The situation is reversed in An Giang province whereas each household holds about 1.2 parcels of land averaging at a bigger farm size of 1.2 ha.

With respect to the change in the farm size, generally speaking, average agricultural land per household has been declining in terms of both total farming area and paddy field area. The decrease in household's agricultural land is apparently caused by the increase in population and hence the separation of household.

Of course, the authors are not ruling out the case wherein land has been actively transacted among people through transfer, mortgage, and the like. Over the period from 1996 to 1999, average land per household decreases at about 9% and 3% per year in each province, respectively.

Farmland of surveyed households in Ninh Binh province concentrated to the size of about 0.2 - 0.5 ha while it was not the case in An Giang. Table 4.2 shows that land distribution in Ninh Binh was quite unimodal with 71 % of households in the sample belong to the group of 0.2-0.5 ha, having an average area of 0.31 ha. The number of household belong to the quintile 0- 0.2ha was 28 with the average size of 0.16 ha. It is seemingly possible to characterize the land distribution pattern in Ninh Binh as small in the farm size and unimodal in distribution. In other words, farmers here are equally small in terms of land holdings. The distribution pattern is quite similar between two communes in Ninh Binh province.

In contrast to Ninh Binh, it is quite difficult to point out a mode of land distribution in An Giang. Land here is distributed heterogeneously falling in all categories of the classification. The highest frequency is landless group (26%), then followed by the group of 1-3 ha (22%). Those groups of smaller than 0.2 ha, of 0.2-0.5 ha, and of 0.5-1 ha account for 14%, 16%, and 15% of the sample, respectively. At this province, in parallel with landless households, there are also some households with quite large agricultural land of 6 ha.

The analysis above initially implies the difference in the primary resource endowment between the two provinces. As will be showed later, this factor is very important in determining the economic activities in each province.

The tendency seen in Ninh Binh province was of narrowing the farm size in all categories. By comparison between Table 4.2 and Table 4.3, it appears that land size was smaller in 1999 than in 1996. Furthermore, the numbers of households fallen into lower groups in terms of land holdings are increasing. In An Giang province, if we exclude the landless from the calculation of the land per household, average land holdings of each category were stable or slightly increased.

From the interview, it can be pointed out that the main factor for the contraction of farm size per household was the emergence of new households by separation. Land was redistributed and some was transferred to young and newly emerging households.

One of the most striking fact realized from the tables was the substantial increase in the proportion of landless and near landless households in An Giang, while the problem still has not emerged in Ninh Binh. In 1996 the landless, and near-landless (household with agricultural land smaller than 0.2 ha) accounted for 17% and 9% in An Giang. These figures rose to 26% and 14%, respectively, by 1999.

As many researchers had pointed out, there are several reasons for this phenomenon (Nguyen The Nha 2000, Shindo and Izumida 2000). Here we do not refer to factors, but still we have to stress the seriousness of this problem. Vietnamese government has given significant attention to this problem. In order to deal with this issue, comprehensive studies are needed to differentiate it by causes. Differential

policy measures can appropriately be taken to ensure both social equity and production efficiency.

4.1.2 Labor

In this section, we would like to discuss about the situation of labor of surveyed households in terms of labor forces, of quality of labor, and of the employment status. Tables 4.4, 4.5, and 4.6 help to illustrate the analysis.

On the average, total family members in 1999 were 4.16 and 5.72 persons per household in Ninh Binh and An Giang, respectively. Of which, there were 2.70 and 3.93 persons who were considered as labor force. Labor force is simply defined here as those people whose ages are ranging from 15 to 60 years old. The figures themselves indicate that the production size with respect to labor force in An Giang is bigger than in Ninh Binh. Compared with the situation in 1996 it has been observed that both family size and labor force have been declining. It might underline efforts of the government to lower the birth rate. The family model with a couple and two children is a target of policy makers and planners.

With respect to labor quality, first, it should be noted that in a Vietnamese family the head of one household is the key person who decides on almost all family matters. It is not necessarily that parent (either farther or mother) is the head. Rather he/she should be a person who is able to make decisions and be responsible for the whole family. Therefore, under the context of limited information, information of a household's head can be a good proxy for labor quality of that household.

It was found that the average age of the household head was about 50 and 53 with the education grades attainted of 8.4 and 5.6 for Ninh Binh and An Giang, respectively. The proportions of the household's head holding social positions in the sample were almost equal in two areas at 8 and 9 %, respectively. Compared with 1996, it can be seen that the education level of the head in Ninh Binh has increased. Also the number of the heads holding social positions in An Giang has been substantially decreased.

Table 4.6 shows the state of household employment in the two provinces. On the average, majority of households in Ninh Binh (An Giang) spends 105 (101) working days per year for rice cultivation, 94 (117) days for livestock. It is also observed that there were some households working in rural industries and services (including commercial services and hired labors). The share of total working days of all households in a respective sector in total number of working days of all households was calculated. It is found that the figures in Ninh Binh were 27% for rice cultivation, 21.7% for livestock, 17% for rural industries, 8.6% for commercial services, and 17.5% for hired labors. The corresponding figures for An Giang were: 19.2; 4.6; 14.4; 21.3; and 25.2, respectively.

The notable point is that the number of working days that households spent for rice cultivation was much higher in Ninh Binh than in An Giang. As mentioned above, though the average farm size in An Giang is much larger (nearly 5 times) than in Ninh Binh but the actual working days of household for

rice cultivation is almost the same, even slightly higher in Ninh Binh. It underlines the fact that rice cultivation in Ninh Binh is much more labor intensive farming than in An Giang. Furthermore, farmers in Ninh Binh devote 21.7% of working days in livestock and just 1.5% in fishery whereas in An Giang the figures are 4.95% and 10.62 %, respectively. Similarly, only 8.6% of working days in Ninh Binh are used for commercial services while in An Giang it is 21.3%. In addition, even though all farmers in Ninh Binh are holding land, however, there were still 17.5% of total working days being hired out.

It must be stressed that the problem of underemployment is rather critical in Vietnamese rural areas. Several studies have pointed out that although the situation has been somehow easing but it is still crucial (Joint Report 1999, Izumida 2000). We roughly calculated average actual annual working days per labor. It was found that the figures for Ninh Binh and An Giang were 174 days and 117 days, respectively. With respect to wage rate, surprisingly, it was much higher in An Giang (23 thousand VND per day) compared with the one in Ninh Binh (just 12 thousand VND).

4.1.3 Fixed assets

Next, we would like to discuss about fixed assets of households. It was difficult to get the value of fixed assets neither at historical costs nor current prices, hence we did not attempt to examine the level of fixed assets of household in terms of monetized value. In result, we analyze the level of fixed assets by using indicators in terms of number (Table 4.7) as follows

First, with respect to building (including shop and workshop) or facility, it is noticeable that as many as 82% of households in Ninh Binh had animal cages for raising pigs, fattened swine, and others whereas very few households in An Giang have (only 7%). It can be said that most households in Ninh Binh have engaged in livestock production. Very few households in both provinces reported to have shops and warehouses.

Second, in both provinces very few households are raising buffalo and cattle, while some in Ninh Binh are having sow swine (22 observations in Ninh Binh raising sow swine). In terms of production tools, about 10% of the sample have tractors. About 33% in Ninh Binh and 22% in An Giang have sprayers. There were 14 % of households in Ninh Binh and 28% in An Giang having pumps, and about 47 % and 29% having boats in each province.

It is interesting to compare these figures with the ones of 1996, which are presented at the left hand side of the table. The interesting point is that in most items, the 1999 figures were smaller than the 1996 ones. From the in-depth interview with farmers, it was learned that the main cause for the decrease in animals was mechanization in rural areas. It was quite often to see Vietnamese farmers ploughing and harrowing land by using buffaloes or cattle. Production tools were very simple if not backward. They were almost manually conducted and used with human or animal power. This is the reason why Vietnamese farmers used to say, "A buffalo is a prime asset of household". The situation, however, has significantly

been changing recently. In Ninh Binh and An Giang, farmers are no longer using buffaloes or cattle for earth working. At present, they hire tractor's owners to do land preparation for them. Except for some areas where cow/ox, buffaloes are raised for milking or for meat, nowadays few farmers are raising them. From the survey, it is found that 100 % households in the Ninh Binh sample hired tractors for land preparation while the figure for the An Giang sample is about 73% (45 out of 63 households hire tractors for land preparations).

The situation is quite similar with respect to other production means. As an illustration, farmers are now hiring threshers to separate paddy from straw, renting pumps to irrigate their paddy field and so on. Again, all households in the Ninh Binh sample hired threshers while it is estimated that about 30% of households in the An Giang sample did so.

It is pertinent to ask the question why under the circumstance of abundant surplus labor, mechanization is progressing (in some links of the production process). It is rather difficult to pinpoint exactly the causes. It is believed that the following factors are crucial: (1) Work done by machines are often better in terms of quality; (2) Rural household income has been significantly increasing; and consequently (3) Farmers want to ease their burden in farming, or to increase "leisure time". Even though the use of machines does not lead to an increase in cash revenue or decline in cash expenditure, farm households are willing to pay the charge. This phenomenon is called as subjective equilibrium of agricultural households (Izumida 2000), and growth of farm income might create the situation that they have come to have leeway for paying the cost.

4.2 Production costs

4.2.1 Costs of rice production

We move on to examine the costs of productions of agricultural households. As far as our survey is concerned, it is quite common to see that the household is engaging in rice cultivation, livestock (swine raising), and fish farming. Hence, these three activities were selected to interview households to examine the cost and profitability of productions. For the analysis in this paper, the data were pooled by province.

Rice is cultivated in both provinces. In Ninh Binh, it is grown in the winter-spring and the winter crops while in An Giang it is mostly cultivated in the winter-spring and the summer-autumn crops. Especially, because of gains in terms of rice price in 1999, some farmers (7 households in the sample) in An Giang grew rice even for the third crop in the year.

Tables 4.8 and 4.9 exhibit the costs of rice production calculated for each crop in Ninh Binh and An Giang. Total costs of production per ha, including family labor costs, were 7,099 thousand VND and 5,857 thousand VND for each crop in Ninh Binh. The corresponding yields were 5,344 kg and 4,643 kg. With paddy price were 1,860 VND/kg and 1,960 VND/ kg incomes earned per ha, which is calculated as total revenue deducting total costs plus family labor costs, were about 5.35 and 5.24 million VND in

each season.

In An Giang, total costs per ha for the winter-spring, summer-autumn, and for the third crop were as follows: 5,637, 5,821, and 4,850 thousand VND. The corresponding yields per ha were 6,264, 4,494, and 3,571 kg per ha. In 1999, average price per kg of paddy was about 1,700 VND. Incomes per ha in each crop were about 6.7, 4.0, and 1.8 million VND, respectively.

It is quite interesting to note the difference in cost structures among crops and between provinces. It is clearly seen that farmers in Ninh Binh are extensively using manure (a kind of organic fertilizer) in production whereas none of it is used in An Giang. Furthermore, the expenditure for herbicide and pesticide are much higher in An Giang (roughly about 3 times higher). The authors think that relevant attention should be given to this matter to make agriculture more environmentally friendly and to make product safer.

Another is the hiring cost for land preparation. Compared with the figures of Ninh Binh with the ones of An Giang, it was realized that there was a significant difference. Even though the wage rate in An Giang was about twice higher than in Ninh Binh, the hiring costs for land preparation in Ninh Binh was significantly very much higher than the ones in An Giang. Again, farmers in Ninh Binh hold small areas with the bigger number of parcels than in An Giang. These figures suggest that farmers in An Giang are seemingly enjoying benefits of the economies of scale in rice production. Anyhow, the existence of scale economy in paddy production should be econometrically examined in the future.

We would like to add a few words to discuss about the third rice crop being cultivated recently in the South. Though it is not reported in the table, there were 7 out of 100 households in the An Giang sample to grow rice in the third crop. The question arose is what are justifications for growing the third rice crop in the MRD. Scientists have been openly debating on this matter. The weather in the MRD is quite conducive for growing rice even with frequency of 7 crops per two years. Of course, there is uncertainty for doing so because this region is under the influence of flood annually. Rice is grown in the third crop because of the following reasons: (1) To increase income, (2) To prevent weeds growing in the paddy field, (3) To create more jobs for farmers during slack times, and (4) To keep rice seeds for the next crop. From our calculation, the cost of growing rice in third crop is fairly high, approximately 90% of the costs in the two main seasons (4.3 million VND per ha). The yield, however, is quite low at about 3.6 ton / ha. Given the price in 1999 (1764 VND/kg), the income per ha was about 1.8 million VND. This income was earned at a time where no flooding occurred.

Even in the case in where all four purposes mentioned above are attained, obviously, further studies on this issue need to be conducted. This is because income earned per ha is not so high and land is surely harmed very much. The ecological, environmental problem is seemingly to emerge. Hence, there are some voices to change this cropping pattern by developing a new one. It is quite a headachy matter since any new pattern depends on the market condition.

4.2.2 Costs of swine raising

Next we examine the costs of raising swine in the two provinces. Farmers raise swine in two kinds: fattened swine for pork and sow swine for breeding purposes. For the purpose of comparison, the costs are calculated per kg of live weight.

In Ninh Binh, total expenditure per kg of weight (including expenditures on feeds, on veterinary, and so on, but excluding family labor costs) was 8.78 thousand VND for fattened swine and was 7.67 thousand VND for piggy (Table 4.10). With the average selling prices reported were 8.38 thousand VND per kg of weight of pig and 11.85 thousand VND per kg of weight of piggy, the estimated incomes earned per kg for each were 0.39 thousand VND and 4.27 thousand VND, respectively.

The figures for An Giang are as follows (Table 4.11). Total expenditures were 9.07 thousand VND and 13.01 thousand VND per kg. Average selling prices were 13.21 thousand VND and 21.84 thousand VND per kg. Consequently, incomes earned from each kg were 4.87 thousand VND and 9.24 thousand VND, respectively.

It is quite instructive to compare costs and incomes earned by farmers in the two provinces. Income earned from one kg of weight of pork in Ninh Binh was negative while it was significantly positive in An Giang. The costs excluding family labor costs were approximately equal, but the problem was price. Farmers in Ninh Binh did suffer from the low price of pork. It was a problem causing the deficit of pork raising activities.

With respect to piggy production, the costs were significantly lower in Ninh Binh. However, income earned from one kg in An Giang was nearly twice the one in Ninh Binh. The cause was, again, due to higher price. As well known, piggy is not only to fatten, but also being consumed as a kind of a special dish. Probably, there was a high consumption demand of piggy as food in An Giang, hence, it led to higher price than in Ninh Binh.

Though it is not reported in the table, there were only 7 households raising fattened swine and 4 households raising sow swine in An Giang. On the contrary, almost every household in the surveyed households in Ninh Binh did raise fattened swine and a fairly big number of households (25) raised sow swine for piggy.

The aforementioned finding carries an important implication. Farmers in the RRD may have a custom of raising swine regardless economic profitability considerations. It is considered that raising swine may be a kind of accumulating wealth, or risk protecting means against future uncertainty. It may be able to explain partially a big number of households raising swine in 1999 even though they did suffer from loss. It is still, however, ambiguous to understand why there were rather few households in An Giang raising swine. It is surmised that even positive income reported, but earning may be not enough compared to rice production.

The authors learned from interview that Ninh Binh authorities wanted to develop their economy by

diversifying agricultural production. This can be achieved by moving toward livestock, especially raising swine. The province is now searching for a new raising method, choosing new swine breed with higher proportion of lean meat and other attributes. The most crucial point, however, is to find out the market. It could be the expansion of the domestic market and/or the penetration into the international one. It is believed that only by doing so, pork can be sold with higher prices and the problem of unprofitable agricultural production can be dealt with.

4.2.3 Costs of aquaculture production

Aquaculture emerges as a potential sector helping to change the structure of the rural economy in Viet Nam. There are several rational bases for that expectation. First, rural Viet Nam has potentials conducive for expanding aquaculture. With large areas of water surface including fresh, brackish water, and sea it seems to show unlimited production capacity. Secondly, parallel with the increase of income, people are changing their preference toward eating fishery products. And thirdly, these products have significant competitiveness in the international market.

Surveying the cost of aquaculture production in the two provinces (Table 4.12), it was found that the total cost invested to get one kg of product was just 3.76 thousand VND in Ninh Binh and about 9.8 thousand VND in An Giang. With average selling prices of 8.2 thousand VND and 11.95 thousand VND, the reported income is about 4.15 thousand VND and 2.15 thousand VND in each province, respectively.

The cost structure is quite different between the two provinces. In Ninh Binh, fish is not commercially produced, but rather it is a kind of self-supply activity to utilize a small area of water surface such as pond or cannel. It looks like extensive farming with less investment. In contrast, aquaculture in An Giang is much intensive with a huge investment, which sometimes, an ordinary household cannot afford. It was reported that fish farming in cages has been rapidly developing recently in the South. The problem is to find out a good market link for the product with reasonable prices to encourage farmers to invest further in this potential sector.

4.3 Household income

What is concerned at the end of this chapter is how the production and incomes of surveyed households have been resulted in. We would like to examine by considering the primary incomes of surveyed households exhibited in Table 4.13. The table shows the primary income sources of the surveyed households 1999 and in 1996. At a first glance, we can find out that the number of households whose income rely primarily on agriculture has decreased significantly. Instead, households relying on salary in both advanced regions, Ninh Phong (Ninh Binh) and An Chau (An Giang), increased in number dramatically. Another remarkable change is on income earned from hiring out daily labor. Especially in An Chau, there were as many as 20%

of the sample households whose income relied primarily on earning from daily labor in 1999, while only 2% (one households) did in 1996. This fact would illustrate the significant change of households' economy in An Chau. In the light of the findings from Table 4.2 and 4.3, showing landless or near-landless (less than 0.2 ha) increased in frequency during the same period, increasing the importance of non-agriculture sector is obvious.

Then, let us turn to further analysis of the income structure of the surveyed households. Table 4.14 shows the structure of households' income on the basis of 50 households in each commune. From this we can also observe the number of households under each category as well as the ratio of income in total income of surveyed households.

Total income per household differs from 7,861 thousands dong (Ninh Phong) at lowest to 26,126 thousands dong (An Chau) at highest. Even per-household's income of Vinh Binh (less advanced region in An Giang) shows higher income twice as much as those of two communes in Ninh Binh. Those gaps above are likely to come from the following factors. Income from crop cultivation differs accordingly to farmland size as we have already seen. Above all, there are significant gaps in total households' income from paddy farming, which differ from 130-140 million VND (of total surveyed households' income in Ninh Phong and Ninh Thang) to about 500 million VND in Vinh Binh. We also have to pay much attention to livestock sector. Raising swine in each village in Ninh Binh is much popular with 41-47 households' participation, however its earning is quite small or negative. That is obviously caused by deficit operation in the swine-raising sector with large part of households in the red. The table indicates that 11 among 41 households (Ninh Phong), and 31 among 47 households (Ninh Thang) were in the red.

Then, let us examine the income structure by quintile income groups as shown in Table 4.15. Dividing 50 households into five groups in increasing order creates quintile groups. Although this table is complicated somewhat, several important points can be pointed out. First, crop cultivation sector is neutral to income structure in two communes of Ninh Binh, while it affects income structure to some extent in two communes of An Giang. Second, with respect to the livestock production and aquaculture, there was a tendency that high-income household earned more, but there were some households losing money in livestock and fish production. On the other hand, in livestock production of An Chau and fish raising of Vinh Binh, there are some specialized farmer earning rather stable income. Third, handicraft and service sectors are very much dominated by top quintile groups especially in An Chau. This tendency can be seen in other communes more or less. Fourth, employment opportunity such as salary working or daily wage labor can be a good source of income, but from the table there was no clear-cut tendency of the relation with income quintile.

From above analysis, we could see that considerable changes in income structure are occurring in rural Viet Nam. In this process some households with favorable conditions tend to receive more fruits than the others. As far as four communes surveyed are concerned, An Chau in An Giang province is the top in the rank of income or economic size, followed by Vinh Binh. The other two are rather similar in terms of

income level or economic activities. However, we want to emphasize that inequality index given by GINI index is also much higher in those commune such as 0.436 (An Chau) and 0.480 (Vinh Binh), while those of two communes in Ninh Binh are clearly lower as 0.387 (Ninh Phong) and 0.350 (Ninh Thang).

Concerning the income from agricultural source, one point should be added. Table 4.16 shows the marketing activities of paddy farmers. It is found that paddy farmers in two communes of Ninh Binh are characterized as self-consuming. Around 30 % of surveyed households did not sell rice, and maximum sales volume didn't go beyond 5000 kg. Even when the price of paddy goes up, cash income of paddy farmers in Ninh Binh will not be improved. On the other hand, paddy farmers in An Giang can be characterized as commercial ones. Most farmers sold paddy, and there were several farmers who sold out over 30,000 kg of paddy. The share of paddy farmers belong to top two quintile occupied more than 80 percent in whole sales volume. This situation implies the big difference in bargaining power among households in An Giang. Anyway, it should be fully recognized that by and large farming activities in RRD are not market oriented, while that in An Giang are well commercialized. When considering the policy options, the regional difference in the characteristic of farming should be taken into account.

5. Agriculture and rural related organizations

5.1 Rural finance

Concerning the financial activities of surveyed households, the following points are observed from the field study in 2000 comparing with that in 1997.

First, the VBA is still a leading lender then followed by the VBP (Table 5.1). Out of the sample of 200 households surveyed in the two provinces in 2000, there were 76 households in total borrowing from both the formal source and the informal one. The number of household borrowed from the VBA was 48 with the average amount of 7.5 million VND, and 16 borrowed from the VBP with the amount of 2.4 million VND. Quite small numbers of households borrowed in 1999 from PCFs and other formal sources, or from informal sources.

Second, compared with the situation in 1996 (Table 5.2) it is interesting to realize that the structure of the Vietnamese rural finance in surveyed areas is almost unchanged but the activity level of the system in 1999 become less busy compared to 1996. There were as many as 88 out of 200 households borrowed from the VBA in 1996, the figure for VBP was 17 and for aggregate informal source was 24. Total number of borrowed households in 1996 was 112, and it turned into 76 in 1999. Among others, the VBA has experienced the big drop in terms of the number of borrowers although the average lending amount per household was almost the same at the two years. The VBP's clients decreased slightly but the average lending amount per household has increased. However, because the VBP is a policy bank, the figure does not imply so much to the overall performance of the system.

Third, another important point is the full disappearance of Rotating Saving and Credit Associations (ROSCAs) in the sample. It is quite hard to made stronger implication for the whole country because the sample is quite small. However, the finding coincides with the authors' observations on this matter. Parallel with the development of formal finance, ROSCAs and other informal finance seemed to play a lesser role. One dominant reason for the declining of the number of borrowers might be the increase in the households' income.

Some features on Vietnamese rural finance might be changing. Previously the lack of loanable funds was common among regions. This caused credit rationing as discussed in Pham Bao Duong and Izumida (2000). For example, the 1997 survey showed that among households borrowed from the VBA in 1996 there were as many as 33% households being rationed by the bank. The situation in the 2000 survey was quite different. In 1999, among 48 households borrowed from the VBA, there were only 4 ones in An Giang being rationed which accounted for just only 8%. The VBA branch in Ninh Binh reported that they were able to self-balance between local mobilization of funds and lending. We did not encounter any cases in Ninh Binh in which credit rationing occurred. However, the VBA in An Giang was still being channeled with some amount of funds from the VBA central to meet the provincial demand.

Concerning the term structure of the loans, in previous years, the majority of loans were short-term loans. The current situation marks a significant change in the term structure of the loans. From the survey, it found that 69% of the VBA loans were short-term and the remainder of 31% was medium/long-term in 1996. The figures for VBA loans in the sample were 64% and 36%, respectively, in 1999. It was claimed in the VBA report that medium- and long-term loans accounted for 41% of the total VBA loans in 1999.

Table 5.3 shows destinations of borrowed funds. From the table we can see that 54% of all borrowings were for agriculture (cultivation and livestock accounted for 27% and 24 % respectively); 21 % was used for production other than agriculture in which was mostly for trade and services (18%). The rest was for consumption in which mostly was for constructing houses.

Further analysis on the compositions of the VBA and the VBP loans show some differences. While borrowings for agriculture accounted for 63% of the VBP loans (mostly for livestock 50%), it was just 48% with respect to the VBA (livestock accounted for only 8%, cultivation: 38%). In the analysis of production costs, it has been pointed out that rice production still results some positive income earnings, while for swine raising it was negative. The VBA loans, which are commercial, quite differ with the VBP loans in the nature of interest rates, of duration, and so on. Therefore, these compositions are quite understandable. Another difference is that consumption borrowings accounted for 33% of the VBA borrowings whereas it was 13% of the VBP.

Compared with the situation in 1996 (Table 5.4), the sharp change is observed. Agricultural borrowing at that time was dominant with 83% in total in which about 50% was for livestock. Borrowings for handicraft (sidelines), trade and services, and consumption accounted for only few percentages. The change in reported

purposes of loans throughout reflects the diversification of agricultural and rural economy as well as the diversified needs for loans from rural households.

5.2 Mass organizations

Mass organizations play important roles in rural community. They are, in general, political social organizations established for particular groups whose members share the same interests. The salient feature of these organizations is that they are representatives for their members, and hence, it is safe to assume that these organizations are forums where members' voices can be assembled and channeled to higher incumbent authorities effectively.

Table 5.5 shows that there are 32 households in An Giang and 81 households in Ninh Binh participating in mass organizations. The figures, not surprisingly, indicate the wide coverage of mass organizations in the North, compared with that in the South. It is also consistent with our observations from interviewing with these organizations in various levels ranging from the Central to the provincial and to the district level. In psychological questions asking farmers about the roles of these mass organizations in households' economic activities, most answers in Ninh Binh express that these organizations are very crucial (79 households say they are very much needed, 4 households report that they are needed). It also can be seen that the majority of farmers in An Giang recognize the necessity of having these organizations in their economic activities (out of 57 responses, there are 13 expressing that very needed, 24 are needed, 15 gave no answer, and only 5 answers indicate no need). This strengthens our arguments about the crucial roles of mass organizations in households' economic life.

5.3 Agricultural cooperatives

Prior to Doi moi, daily life in rural areas was quite familiar with agricultural cooperatives in the North and production groups in the South. These forms of farmers' cooperation had played an important role in bringing small farmers together to develop production and to take care partially members' life. During the process of changing from the centrally planning mechanism to the market oriented one, weakness of these forms emerged; some have showed their inefficiency of incapable to cope with the changing circumstance. A number of old coops and production groups were completely dismantled, some have still existed but just in their names, and of course some have dynamically coped with the new situation and to continue to thrive.

At this moment, the performance of coops is mostly focusing on providing limited services to members such as irrigation, electricity, and plant protection. Few coops are also dealing with other services: fertilizer, seeding supplies, land preparation, field protection, agricultural extension, and veterinary. It is learnt that very rare coops involve in marketing and financial business. In particular communes where the survey was taken place, there are 88 households in Ninh Binh reported that they perceive the existence of cooperatives

while no ones in An Giang did so. Furthermore, consulting with Table 5.6 we see that cooperatives in Ninh Binh have been actively servicing their member in some activities such as agricultural inputs (including seed supply), plant protection, and irrigation. Few households enjoy the service of land preparations provided by cooperatives (only 4 households). The marketing service is not available in any cooperative in the sample.

We also asked psychological questions to households on the necessity of having cooperatives. The answers are rather mixed (see Table 5.6). Out of 52 responses in An Giang, there are 3 indicating that they are very in need of having cooperatives, 16 expressed that they are in need, 13 said no need (20 answered no opinion). It shows the trivial roles of cooperatives in the An Giang households' economic activities. In contrast, out of 85 responses in Ninh Binh, 83 households indicated that cooperatives are very much needed suggesting the indispensable roles of cooperatives in Ninh Binh province.

Concerning the role of agricultural cooperatives or mass organizations, we would like to refer to Table 5.7, describing the activities of agricultural extension. From this table, we see that about half of households in An Giang have been guided on using new varieties, on farming methods, particularly IPM method while the figures are much higher in Ninh Binh province (around 80 households). Consequently, there were 22 households in An Giang employing new varieties with high yields. In terms of area, it accounted for 38% of total cultivated areas. The figures for Ninh Binh are 82 households with the proportion of 70%. Similar findings can be found with respect to livestock raising, in which majority of farmers in Ninh Binh use mix feeding and newly breeding varieties while very few in An Giang do so. Since most agricultural extension activities are conducted by mass organizations or cooperatives, it can be insisted here that if cooperatives are established as an economic body with a strong tie with mass organizations, farmers will surely be able to benefit. To create more active agricultural cooperatives, involvements of mass organizations such as Women Union and Farmer Association is worth to be considered. Anyhow, this issue should be discussed fully in the near future.

6. Summary and conclusions

6.1 Changes in agricultural structure

The changes over the three years in the distribution pattern of rural households by farming size can be depicted as in Figure 1. The distribution of households by farming size in Ninh Binh province is very unimodal. There were no landless households (defined as household without any agricultural land) either in 1996 or 1999. The whole distribution shape of households shifted to the left in 1999 compared with 1996, indicating an overall decrease in size. The cause of the decrease can be attributed to household separation. As pointed out in the paper by Nguyen The Nha (Nguyen The Nha, 2000), farmers in the RRD have special mentality to their farmland and are unwilling to give it up voluntarily. Owning land is, in a

sense, a means of safeguarding their livelihood.

In contrast, the distribution pattern of households by farming size in An Giang is bimodal and involves considerable variation compared with the pattern for Ninh Binh. Furthermore there is a certain percentage of landless households (please note that it is the distribution pattern of rural households containing landless but not of agricultural household). This distribution pattern is identical in both Vinh Binh and the suburban village of An Chau. In 1999, there was an increase in the landless bracket while the number of farm households of average farming size, forming the other peak, decreased. The number of households belonging to the large farming size quintile, which appears on the right in the figure, has barely changed. Actually, there are only a few households that have expanded their farming size. Similar changes in distribution pattern can be observed for each of two communes. One of the reasons for a decline in farming size may be household separation. However other plausible factors have yet to be examined fully.

Based on the above analysis, it is suggested that the land using structure in Ninh Binh is rigid while that in An Giang is changing dynamically. A considerable increase in the number of landless households in An Giang (seven households) in only three years attracts attention. Although the reasons for the change have not been fully explained, the fact that some of those involved in the change are civil servants or wage workers suggests that one of the causes may be change of employment or occupational mobility. It is not always correct to regard the landless as straggler in agricultural business.

It is also important to note that the reduction in farmland of some households has not resulted in the expansion of others. The change in the agricultural structure in An Giang did not follow the pattern we initially expected with a polarization of farmers. Of course it is questionable whether we have sufficiently identified overall changes in agricultural structure in our survey, since we lacked full information about those who acquired farmland from those who became landless. There was also a considerable gap between the figures obtained through interviews with people in people's committees in Vinh Binh and An Chau (2.2 ha and 0.5 ha, respectively), and those for the surveyed farm households (1.2 ha and 1.0 ha respectively) for average agricultural land area per household. There may be a bias in sampling. It is also underlined that Red River Delta area has the problem of "small and scattered land parcels".

Changes in household income in the surveyed area are summarized in Table 6. In general, the share of non-agricultural income is high with diversified income sources, but with conspicuous differences between areas.

Additional information on the income of surveyed households is as follows: First, the number of households, which depend on agriculture as their largest income source, has fallen in every area, whereas the number of households with wage income as their largest income source has risen. Particularly in An Chau, the number of villagers who obtain income through daily and other type of employment is increasing. The same thing occurs in Ninh Thang of Ninh Binh province where an increasing number of households give their major income source as coming from non-agricultural sectors such as trade and services or

"family" industries.

Secondly, dependency on part-time jobs in non-agricultural sectors, measured in terms of working days (percentage of the total working days engaged in "family" handicraft business, trade, and employment against the total annual working days), is 44% in Ninh Binh and 60% in An Giang. The rate of work performed in the non-agricultural sectors seems to be considerably increasing, although corresponding figures for 1996 are not available.

Thirdly, concerning agricultural income (including aquaculture), livestock farming in Ninh Phong and An Chau, and fish production in Vinh Binh are notable, giving the impression that diversification is proceeding in the agricultural sector. It is worth noting that in Vinh Binh, fish production and livestock farming are specialized and in receipt of a large amount of investment, while livestock farming (swine raising) in Ninh Binh is small-scale and on average unprofitable, according to the present survey. So it appears that agricultural diversification with relatively high productivity requires a certain scale and specialized knowledge or managerial experience.

Fourthly, the crop sector income is significant when the size of farmland is large as in Vinh Binh. In Vinh Binh in An Giang Province, about half of the surveyed households sell more than five tons of paddy. In contrast, in Ninh Binh Province, 35 households out of 100 households do not sell paddy, which indicates that rice growing can hardly be a source of cash income for small-sized farm households. For large-sized farm households selling more than five tons of paddy, this income is important because the sale of 5,000 kg of paddy (at a price of 1,860 Vietnamese dong per kg) realizes 9.3 million dong (In An Giang 35 farm households sell over five tons of paddy).

6.2 Future directions

When we discuss the future directions of Vietnamese agricultural structure, we have to take into consideration the great regional differences. In Ninh Binh, the farming size is tiny and the distribution is unimodal. In An Giang, average farm size is relatively large, and the distribution is somewhat diversified. Changes in farming size through land market in the RRD, as explained above, are hardly noticeable due to the farmers' adherence to their farmland. Accordingly, the expansion of farm size through farmland accumulation is not expected. So it is unreasonable to assume an improvement in agricultural productivity in the RRD through an increase in the farming size. Considering the smallness of farmland and existing population pressure, agricultural development in this area should pursue the directions for the development of land saving agriculture, with intensive uses of labour and current inputs. Fruits, vegetables, aquaculture, and livestock, are the candidates.

Policies involving the provision of market information, and the transfer of technology and know-how, are still important. Livestock farming, for example, is possible, however small-sized side-business operations are not likely to be significant, except as a means of self-protection against disasters. Consequently, livestock

raising should be promoted by increasing the scale of farming and by specialization. For that purpose, research and development in livestock farming, including the development and dissemination of technology should be encouraged. Also, measures for securing cheap and high quality feed will be necessary. These products sometimes require big amount of capital for new equipments, hence, the sufficient provisions of loans will be needed.

In order to deal with the problem of dispersed land parcels, a system for transferring or integrating farmland needs to be established. It will also be necessary to create a system for proper land assessment. For that assessment, land market should be activated by abolishing or loosing many regulations.

In the Mekong River Delta, where land transaction is active, a number of households have lost their farmland. According to the results of our survey, however, large size agricultural households are not emerging. Nevertheless the possibility of their existence cannot be altogether denied because some papers have reported their emergence. Concerning the existence of scale economy, it will be required to econometrically test using the data of farm households. While their existence is likely to be proven, they have yet to be confirmed.

It will obviously be necessary to create an environment for mobilizing land-ownership and promoting the establishment of efficient, large-sized business management. Considering the excess labor forces in rural areas, as discussed in the paper by Izumida (2000), policies for nurturing efficiently managed large-sized entities with employment should be developed.

With respect to the landless, it is necessary to distinguish those who have become landless due to ordinary changes of employment from farmers who have lost their land, mostly becoming agricultural laborers. For the former group, measures for a smooth change in occupation will be required, such as education, vocational training, and job information, while the farmland that has been released should be transferred into the hands of motivated and efficient management farmers. As for the latter group, social measures including guidance in changing occupation should be taken. Redistribution of farmland to the landless should be conducted carefully.

Looking at Viet Nam as a whole, diversification in agriculture is in fact advancing. However small-scaled facile diversification does not mean much for the productivity increase of farm household. For instance, as found in the north, raising one or two pigs is barely advantageous to a farm household with 0.2 ha of rice paddy. Diversification can be effective for the improvement of the farm household economy and productivity only when a new sector is introduced at a certain scale. To achieve this specialization and investment are required. Of course the transfer of technology and managerial guidance from extension office and provision of agricultural credit is needed.

Even though farmers' incomes have improved to a certain extent through advances in agricultural productivity and diversification, a general and significant improvement in all farm households' income will not be expected, since huge number of surplus labor force remains in the rural sectors. Hence, pressures on farmland caused by over-population have to be reduced through the process of absorbing surplus labor

into non-agricultural sectors within either villages or cities. At any rate, policies for alleviating the pressures from abundant rural labors are crucial for the further development of agriculture in Viet Nam.

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Table 3.1 The situation of land, labour employment in Ninh Binh province

Indicators	Unit	1995	1996	1997	1998
1. Average rural population	Person	807,924	818,071	783,748	776,354
The share of rural in total population	%	91.0	90.9	86.7	86.5
2. Agricultural, forestry, and fishery labour	Person	312,760	317,810	320,990	315,540
The share in total labour	%	80.6	79.6	79.6	78.3
3. Number of industry producing households	Households	9,754	10,156	11,861	11,818
4. Total land area	Ha	140,117	140,578	142,074	142,763
4.1 Agricultural land	Ha	66,247	66,274	67,307	67,125
- In which: Paddy land	Ha	48,725	48,919	49,317	49,596
Agricultural land / labour ratio	Ha	0.212	0.209	0.210	0.213
4.2 Unused land	Ha	36,582	35,244	36,562	36,478

Source: Compiling from Statistical Yearbook of Ninh Binh, 1998

Table 3.2 The compositions of Ninh Binh economy

Indicators	Unit	1995	1996	1997	1998
1. GDP at current prices	Mil. VND	1,377,762	1,394,908	1,598,729	1,885,208
1.1 GDP of agriculture and forestry	Mil. VND	752,682	644,339	756,525	973,501
- The share in total	%	54.6	46.2	47.3	51.6
1.2 GDP of fishery	Mil. VND	18,611	19,349	20,590	23,463
- The share in total	%	1.35	1.39	1.29	1.24
2. Agricultural GDP composition	%	100	100	100	100
2.1 Cultivation	%	74.0	72.6	72.9	79.0
- The share of paddy	%	65.7	60.1	64.8	71.6
2.2 Livestock	%	24.9	26.6	26.3	20.2
- The share of domestic animal	%	59.0	61.4	63.9	62.5
2.3 Agricultural services	%	1.1	0.8	0.8	0.8
3. Saving deposit at banks	Mil. VND	101,116	136,421	211,840	293,658
4. Short-term outstanding loans to agri., fores., fishery	Mil. VND	55,377	76,512	69,090	62,700
- Percentage of loans in GDP	%	7.2	11.5	8.9	6.3

Source: Compiling from Statistical Yearbook of Ninh Binh, 1998

Table 3.3 Some indicators on production of key sectors of Ninh Binh economy

Indicators	Unit	1995	1996	1997	1998
I. Rice cultivation					
1. Planted area of paddy	ha	80,278	67,862	80,915	81,641
2. Yield of paddy	100kg/ha	39.46	40.80	46.33	49.65
3. Gross output of paddy	Tons	316,800	276,877	374,840	405,346
II. Planted area of other crops					
1. Annual industrial crops	ha	8,144	7,563	8,622	8,927
2. Long-term industrial crops	ha	690	710	750	751
3. Fruit crops	ha	4,211	4,106	4,168	4,409
III. Livestock					
1. Number of buffaloes	1000 head	25.41	22.49	22.12	22.09
2. Number of cattles	1000 head	24.41	22.08	21.18	23.71
3. Number of pigs	1000 head	248.5	249.36	259.82	262.6
4. Number of poultry	1000 head	1993	2196	2629	2603
5. Number of goats	1000 head	22.65	17.56	10.95	17.76

Source: Statistical Yearbook of Ninh Binh, 1998

Table 3.4 The situation of land and fish farming in An Giang province

Indicators	Unit	1986	1996	1997	1998	1999
1. Cultivated land area	ha	245,037	242,849	242,983	246,110	246,206
2. Land using ratio	time	1.23	1.93	1.85	1.94	2.08
3. Total sown land area	ha	301,728	469,070	449,986	477,289	512,406
a. Paddy	ha	258,805	432,229	421,750	444,750	477,058
- Spring - winter	ha	103,115	203,170	209,837	212,458	217,285
- Summer - autumn	ha	80,090	202,230	195,704	210,366	212,939
- Autumn - winter	ha	0	4,498	1,022	5,221	32,033
- Monsoon	ha	75,600	22,331	15,187	16,705	14,801
b. Other cereal crops	ha	42,923	36,841	28,236	32,539	35,348
4. Aquaculture area	ha	351	1,299	1,156	1,106	1,225
- Paddy field area	ha	0	233	208	176	176
- Pond	ha	351	1,066	948	930	1,049
5. The number of cages,	cage	645	2,053	2,102	2,070	2,439

Source: Report of An Giang Provincial Department of Agriculture and Rural Development

Table 3.5 The composition of labour in An Giang province

Unit: %

Indicators	1996	1997	1998
1. Agricultural labour	82.92	80.30	80.10
2. Labour in industry and construction sectors	6.84	6.80	6.00
3. Labour in service sector	10.24	12.90	13.90
Total	100	100	100

Source: Report of An Giang Provincial Department of Agriculture and Rural Development

Notes: 1. Rural labours account for 81% total working labours.

The composition of rural labours is 90% agricultural labours, 10% non-agricultural labours.

2. Urban labours account for 19% total working labours. The composition is 20% agricultural labours, the rest is for other sectors.

Table 3.6 The compositions of An Giang economy

Indicators	Unit	1995	1996	1997	1998	1999
1. GDP at current prices	Mil. VND	5,516,171	6,342,604	7,147,859	8,976,765	10,244,283
1.1 GDP of agriculture, forestry, and fishery	Mil. VND	2,955,922	3,062,083	3,117,926	4,271,933	4,621,754
- The share in total	%	53.6	48.3	43.6	47.6	45.1
2. Agri., fores., fishery GDP composition	%	100	100	100	100	100
2.1 Agriculture	%	87.7	86.2	86.4	89.1	88.9
2.1.1 Cultivation	%	67.3	66.0	65.7	74.6	73.6
2.1.2 Livestock	%	9.9	10.3	10.3	6.7	7.0
2.1.3 Agricultural services	%	10.5	9.9	10.5	7.8	8.3
2.2 Forestry	%	1.4	1.4	1.9	1.4	1.3
2.3 Fishery	%	10.9	12.9	11.7	9.5	9.9

Source: Report of An Giang Provincial Department of Agriculture and Rural Development

Table 4.1 Land of surveyed households

Province	Commune	1996			1999				
		Total farming area (ha)	In which: Paddy field area (ha)	In which: Pond/ cannel areas (ha)	Total farming area (ha)	In which: Paddy field area (ha)	In which: Fruit land (ha)	In which: Pond/ cannel areas (ha)	The number of parcels (parcel)
Ninh Binh (The North)	Ninh Phong	0.33	0.28	0.06	0.252	0.225	0.0264	0.042	5.8
		50	*50*	*20*	*50*	*50*	*2*	*18*	*41*
	Ninh Thang	0.39	0.31	0.03	0.271	0.264	0	0.023	6.57
		50	*50*	*16*	*50*	*50*	*0*	*16*	*49*
	Ninh Binh	**0.36**	**0.3**	**0.05**	**0.262**	**0.244**	**0.0264**	**0.033**	**6.24**
		100	*100*	*36*	*100*	*100*	*2*	*34*	*90*
An Giang (The South)	Vinh Binh	1.82	1.47	0.16	1.19	1.33	0.025	0.096	1.38
		42	*41*	*13*	*37*	*32*	*1*	*15*	*34*
	An Chau	1.04	0.92	0.11	0.98	1.03	0.44	0.051	1.05
		41	36	12	38	31	11	15	43
	An Giang	**1.19**	**1.37**	**0.14**	**1.08**	**1.18**	**0.41**	**0.074**	**1.19**
		100	*77*	*25*	*75*	*63*	*12*	*30*	*77*

Source: Based on the household survey data

Note: Numbers written in bold-italic are the number of observed households in the sample

Table 4.2 Distribution of farming units by farm size in 1999

(Unit: Mean: ha, Frequency: %)

	Commune	Total	Landless	-0.2 ha	0.2-0.5 ha	0.5-1 ha	1.0-3.0 ha	3.0-5.0 ha	5.0-10 ha
Ninh Binh (The North)	Ninh Phong								
	1. Mean	0.252	-	*0.122*	*0.308*	*0.504*	-	-	-
	2. Frequency	**100**	**0**	**32**	**66**	**2**	**0**	**0**	**0**
	Ninh Thang								
	1. Mean	0.271	-	0.164	0.305	-	-	-	-
	2. Frequency	**100**	**0**	**24**	**76**	**0**	**0**	**0**	**0**
	NINH BINH								
	1. Mean	0.262	-	*0.14*	*0.306*	*0.504*	-	-	-
	2. Frequency	**100**	**0**	**28**	**71**	**1**	**0**	**0**	**0**
An Giang	Vinh Binh								
	1. Mean	1.19	*0*	*0.074*	*0.296*	*0.711*	*1.514*	*3.847*	*6.63*
	2. Frequency	**100**	**26**	**18**	**8**	**16**	**24**	**6**	**2**
	An Chau								
	1. Mean	0.98	0	0.083	0.323	0.602	1.75	3.75	5.3
	2. Frequency	**100**	**26**	**12**	**22**	**16**	**18**	**4**	**2**
	AN GIANG								
	1. Mean	*1.08*	*0*	*0.08*	*0.318*	*0.653*	*1.612*	*3.808*	*5.965*
	2. Frequency	**100**	**26**	**14**	**16**	**15**	**22**	**5**	**2**

Source: Same as Table 4.1

Table 4.3 Distribution of farming units by farm size in 1996

(Unit: Mean: ha, Frequency: %)

	Commune	Total	Landless	-0.2 ha	0.2-0.5 ha	0.5-1 ha	1.0-3.0 ha	3.0-5.0 ha	5.0-10 ha
Ninh Binh (The North)	Ninh Phong								
	1. Mean	0.33	-	0.16	0.35	0.57	-	-	-
	2. Frequency	**100**	**0**	**16**	**78**	**6**	**0**	**0**	**0**
	Ninh Thang								
	1. Mean	0.39	-	0.14	0.32	0.66	-	-	-
	2. Frequency	**100**	**0**	**6**	**70**	**24**	**0**	**0**	**0**
	NINH BINH								
	1. Mean	0.36	-	0.15	0.34	0.64	-	-	-
	2. Frequency	**100**	**0**	**11**	**74**	**15**	**0**	**0**	**0**
An Giang	Vinh Binh								
	1. Mean	1.82	0	0.13	0.20	0.65	1.46	3.60	6.94
	2. Frequency	**100**	**16**	**14**	**6**	**14**	**34**	**6**	**10**
	An Chau								
	1. Mean	1.04	0	0.17	0.30	0.62	1.72	4.10	5.00
	2. Frequency	**100**	**18**	**4**	**20**	**34**	**18**	**4**	**2**
	AN GIANG								
	1. Mean	1.19	0	0.14	0.28	0.63	1.55	3.80	6.62
	2. Frequency	**100**	**17**	**9**	**13**	**24**	**26**	**5**	**6**

Source: Same as Table 4.1

Table 4.4 The situation of labour of the surveyed sample

Unit: person

Province	Commune	1996		1999	
		Total family	Labour	Total family	Labour
Ninh Binh (The North)	Ninh Phong	4.62	2.9	3.94	2.65
	(NP)	*1.6*	*1.59*	*1.66*	*1.54*
	Ninh Thang	4.56	2.78	4.38	2.74
	(NT)	*1.23*	*1.15*	*1.21*	*1.31*
	Ninh Binh	4.59	2.84	4.16	2.7
	(NB)	*1.42*	*1.38*	*1.46*	*1.42*
An Giang (The South)	Vinh Binh	6.34	3.92	5.82	3.54
	(VB)	*2.46*	*2.13*	*2.16*	*1.97*
	An Chau	5.98	4.4	5.62	4.32
	(AC)	*2.06*	*2.04*	*2.09*	*2.19*
	An Giang	6.16	4.16	5.72	3.93
	(AG)	*2.26*	*2.09*	*2.12*	*2.11*

Source: Same as Table 4.1

Note: Numbers written in italic are standard deviations

Table 4.5 Information on head of households surveyed

Province	Commune	1996			1999		
		Age (Years old)	Education (Grade)	Social status (*)	Age (Years old)	Education (Grade)	Social status (*)
Ninh Binh (The North)	Ninh Phong	53.12	5.6	8	54.42	7.98	10
		14.77	*2.69*		*15.19*	*2.68*	
	Ninh Thang	44.96	6.78	12	47.3	8.78	6
		13.67	*1.83*		*11.96*	*1.61*	
	Ninh Binh	49.04	6.19	10	50.86	8.4	8
		14.74	*2.37*		*14.06*	*2.21*	
An Giang (The South)	Vinh Binh	48.72	5.66	36	50.86	5.64	12
		13.39	*2.78*		*13.87*	2.98	
	An Chau	52.62	6.35	24	55.68	5.62	6
		13.78	*3.11*		*13.86*	*3.65*	
	An Giang	50.67	6	30	53.27	5.63	9
		13.66	*2.95*		*14.01*	*3.32*	

Source: Same as Table 4.1

Note: Numbers written in italic are standard deviations

(*) Unit for this item is the ratio of households' head holding position over the sample

Table 4.6 The state of household employment in 1999

Unit: Mean (working days); No. of observations (observations); Composition (%)

Exception: The units for the last row "Wage rate": Mean (000 VND/day); No. of observations (observations)

Working days per year in:	Ninh Binh			An Giang		
	Mean	No. of observations	Composition	Mean	No. of observations	Composition
I. Agriculture, forestry and fishery						
1. Agriculture						
1.1 Cultivation						
Rice	105.27	98	27.06	101.2	63	19.21
Other cereal crops	22.2	5	0.29	0	0	0
Vegetable	52.09	33	4.51	0	0	0
Fruits	32	6	0.5	238.6	5	3.59
Industrial crops	19.08	18	0.9	225	1	0.68
1.2 Livestock	94.09	88	21.72	117.3	14	4.95
2. Forestry	0	0	0	0	0	0
3. Fishery	37.83	15	1.49	110.19	32	10.62
II. Rural industries	184.31	36	17.41	251.79	19	14.41
III. Services						
1. Commercial services	148.91	22	8.59	272.35	26	21.33
2. Employed						
2.1 Regular	201.56	27	14.28	321.23	22	21.29
2.2 Temporary	88.25	14	3.24	129.8	10	3.91
Average actual working days per labour	174.39			117.01		
Wage rate	12.38	71		22.96	9	

Source: Same as Table 4.1

Note: "Mean" here is calculated as an average (arithmetic mean) of values of actual observations in the sample

Table 4.7 Fixed assets of surveyed households

	Unit	1996						1999					
		NP	NT	NB	VB	AC	AG	NP	NT	NB	VB	AC	AG
1 - Shop: Mean	m2	NA	NA	NA	NA	NA		45.0	48.0	46.5			
Number of observations	HH	NA	NA	NA	NA	NA		*1*	*1*	*2*	*0*	*1*	*1*
2 - Ware house: Mean	m2	18.0	14.5		27.5	59.6		15.0		15.0			
Number of observations	HH	*7*	*4*	*11*	*2*	*5*	*7*	*5*		*5*			*0*
3 - Animal cages: Mean	m2	21.91	16.04		10.73	14.89		14.69	14.22	14.43			
Number of observations	HH	*47*	*49*	*96*	*11*	*35*	*46*	*36*	*46*	*82*			*7*
Animals:													
1 - Buffalo: Mean	head	2.0	1.3		16.0	2.0			1.0	1.0			
Number of observations	HH	*2*	*3*	*5*	*1*	*3*	*4*		*1*	*1*			
2 - Cattle: Mean	head	2.0	0.0		4.0	2.4		2.0	4.0	2.0		2.0	2.0
Number of observations	HH	*2*	*0*	*2*	*1*	*5*	*6*	*3*	*1*	*4*		*2*	*2*
3 - Sow pig: Mean	head	1.45	1.06		1.17	1.77		1.00	1.14	1.05		2.00	2.00
Number of observations	HH	*22*	*15*	*37*	*6*	*13*	*19*	*15*	*7*	*22*		*3*	*3*
Machines and Implements:													
1 - Tractor: Mean	tractor	1.00	1.00		1.00	1.33		1.00	1.07	1.05	1.00	2.00	1.50
Number of observations	HH	*3*	*3*	*6*	*4*	*3*	*7*	*3*	*7*	*10*	*2*	*2*	*2*
2 - Harrow + plow: Mean	unit	1.00	0.00		-	1.00			0.75	0.75	2.00	1.00	1.25
Number of observations	HH	*2*	*0*	*2*	*0*	*4*	*4*		*4*	*4*	*1*	*3*	*4*
3 - Sprayer: Mean	sprayer	0.98	1.00		1.09	1.14		1.00	1.00	1.00	1.00	1.09	1.05
Number of observations	HH	*39*	*23*	*62*	*23*	*22*	*45*	*23*	*10*	*33*	*11*	*11*	*22*
4 - Weeder: Mean	weeder	2.06	1.88		1.00	-							
Number of observations	HH	*16*	*25*	*41*	*2*	*0*	*2*			*0*			*0*
5 - Thresher: Mean	thresher	0.99	1.04		1.00	1.00		1.00	0.75	0.97	1.00		1.00
Number of observations	HH	*42*	*26*	*68*	*1*	*1*	*2*	*16*	*2*	*18*	*1*		*1*
6 - Pump: Mean	pump	1.00	1.00		1.23	1.11		1.00	1.00	1.00	1.08	1.00	1.04
Number of observations	HH	*8*	*1*	*9*	*13*	*19*	*32*	*11*	*3*	*14*	*12*	*16*	*28*
7 - Power driven boat: Mean	boat	NA	NA		NA	NA					2.00	1.00	1.29
Number of observations	HH	NA	NA		NA	NA	NA			*0*	*2*	*5*	*7*
8 - Boat: Mean	boat	NA	NA		NA	NA		1.00	1.00	1.00	1.18	1.20	1.18
Number of observations	HH	NA	NA		NA	NA		*33*	*14*	*47*	*17*	*5*	*22*
9 - Carrying cars: Mean	car	NA	NA		NA	NA		2.00	1.00	1.33		8.00	8.00
Number of observations	HH	NA	NA		NA	NA		*8*	*19*	*27*		*1*	*1*
Long-term fruit trees	m2	NA	NA		NA	NA		200		200		800	800
Number of observations	HH	NA	NA		NA	NA		*2*		*2*		*1*	*1*

Source: Same as Table 4.1

Note: NP, NT, and NB stand for Ninh Phong, Ninh Thang, Ninh Binh, respectively. Similarly, VB, AC, and AG stand for Vinh Binh, An Chau, and An Giang, respectively.

Table 4.8 Costs of rice production in Ninh Binh province

Unit: per ha

		Winter-Spring crop			Winter crop		
		Volume #	Prices (1000 VND)	Value (1000 VND)	Volume	Prices (1000 VND)	Value (1000 VND)
I. Material costs							
1	Seed and seedling cost	40.05	15.37	491.39	40.74	14.03	482.11
In	- New varieties:	19.53	20.92	407.08	18.72	21.12	394.73
which:	- Conventional varieties:	20.52	4.04	84.3	21.95	3.91	87.37
2	Fertilizer						
2.1	Manures:	4863.89	0.15	731.19	2908.19	0.15	436.23
2.2	Chemical fertilizer: - N:	204.04	2.05	419.09	153.39	2.03	312.96
	- P:	561.16	1.12	622.23	437.62	1.12	481.99
	- K:	91.53	2.37	217.48	65.76	2.38	157.1
	- NPK:	110.54	1.23	142.1	87.67	1.25	109.16
	- Powdered lime:	63.71	0.22	13.64	5.48	0.22	1.27
	- Other:	2.41	1	2.41	1.51	1	1.51
3	Pesticide:			183.08			116.83
4	Herbicide:			1.29			0
5	Fuel: Petrol, oil	0.24	3.6	2.48	0.23	3.6	2.33
6	Irrigation expenditure						
6.1	Irrigation fee paid to the government:	202.72	1.8	364.9	169.44	1.55	262.64
6.2	Other costs for water using:			0			0
7	Other costs to cooperative:	116.95	1.8	210.52	174.34	1.58	277.52
8	Small tools			52.68			49.15
9	Fixed assets depreciation			2.53			1.81
10	Hiring cost for earth-workings			336.8			350.75
II. Labour expenditures							
a	Family labour	212.6	12,38**	2632.04	189.01	12.38	2339.95
b	Hired labours			330.83			297.42
III. Other expenditures							
11	Paying interest of borrowing			0			0
12	Land use tax	182.98	1.8	329.36	111.16	1.55	172.3
13	Others			0			0
IV. Total cost exclusive of family labour cost*				**4466.92**			**3516.92**
	Yield (kg/ha)	5343.51	1.86	9813.75	4642.64	1.96	8752.68
	Income #*			5346.84			5235.77
	Estimated profit &			2714.8			2895.82

Source: Same as Table 4.1

Notes: The following points are kept in mind in calculations:

\# Units for the columns "Volume" are not explicitly written down

* Total cost here is the summation of I, II, and III exclusive of II. a (family labour)

#* Income here is calculated by subtracting IV. "Total cost" from the output value per ha

& Estimated profit (when being able to calculate) is the subtraction of imputed family labour from income.

** Wage rate used to calculate imputed family labour cost is the one written in the table 4.6 (page 29)

Table 4.9 Costs of rice production in An Giang province

Unit: per ha

		Winter-Spring crop			Summer-autumn crop			Third crop		
		Volume	Prices (VND)	Value (1000 VND)	Volume	Prices (VND)	Value (1000 VND)	Volume	Prices (VND)	Value (1000 VND)
I. Material costs										
1	Seed and seedling cost	321.67	1920.49	617.77	359.52	1916.98	689.2	396.44	1871.43	728.06
2	Fertilizer									
2.1	Manures:	0.00		0	0.00		0	0	0	0
2.2	Chemical fertilizer: - N:	240.96	2097.7	505.47	236.42	2100.97	496.71	204.9	2105.71	419.24
	- P:	23.38	2650	61.97	6.01	2140	12.86	11.14	1120	14.25
	- K:	25.68	2485.66	63.84	22.26	2472.5	55.05	102.45	2515	262
	- NPK:	243.32	2776.47	675.56	229.09	2720.77	623.29	227.62	2860	643.52
	- DAP:	55.90	3321.36	185.67	55.83	3398.5	189.75	22.27	3300	77.51
	- Other:	6.54	2333.33	15.27	25.61	2766.67	70.86			33.41
3	Pesticide:			419.48			429.54			283.3
4	Herbicide:			191.28			198.51			281.07
5	Fuel: Petrol, oil			54.68			71.97			50.11
6	Irrigation expenditure									
6.1	Irrigation fee paid to the government:			71.03			56.41	31.75	1580	50.17
6.2	Other costs for water using:			259.35			237.31	182.36	1650	300.89
7	Field protection			4.19			4.19			0
8	Small tools			3.23			2.93			2.23
9	Fixed assets depreciation			164.86			164.86			111.36
10	Hiring cost for earth-workings			149.76			215.96			92.2
II. Labour expenditures										
a	Family labour									
b	Hired labours			849.44			926.77			574.01
III. Other expenditures										
11	Paying interest of borrowing			130.45			164.1			41.76
12	Land use tax			300.98			223.42			310.98
13	Others			63.5			60.33			0
IV. Total cost exclusive of family labour cost				4787.78			4894.02			4276.07
	Yield (kg/ha)	6263.77	1708.89	11565.12	4494.43	1716.35	8914.83	3571.43	1764.29	6078.4
	Income (= imputed labour cost + profit)			6777.34			4020.81			1802.33

Source: Same as Table 4.1

Notes : The same as the table 4.8 (page 31)

: "Family labour" is not showed in this table since we need to check more about the reliability of the data.

Table 4.10 Costs of raising swine in 1999 in Ninh Binh province

Unit: per kg

Items		Fattened swine			Breeding swine		
		Volume	Price 000 VND	Value 000 VND	Volume	Price 000 VND	Value 000 VND
1	***Breeding swine***			2.07			
2	***Feed costs***						
2.a	*Processed feeds*						
2.1	**Broken rice**			2.26			2.39
2.1.1	Purchased	0.08	2.51	0.2	0.05	2.5	0.13
2.1.2	Family owned	0.84	2.5	2.06	0.91	2.5	2.26
2.2	**Bran**			2.27			2.32
2.2.1	Purchased	0.42	1.96	0.82	0.35	2	0.7
2.2.2	Family owned	0.74	1.96	1.45	0.85	1.95	1.61
2.3	**Maize**			0.65			0.09
2.3.1	Purchased	0.33	2.01	0.62	0.05	2	0.09
2.3.2	Family owned	0.01	1.93	0.03	0		0
2.4	**Sweet potato**			0.02			0
2.4.1	Purchased	0.01	1.1	0.01			
2.4.2	Family owned			0.01			
2.5	**Industrially produced feeds**			0.41			0.45
2.5.1	Purchased	0.06	7.41	0.41	0.06	7.23	0.45
2.5.2	Family owned			0			0
2.6	**Other ( )**			0.08			0.06
2.6.1	Purchased	0.04	3.37	0.08	0.01	4.57	0.04
2.6.2	Family owned			0			0.02
2.b	*Raw feeds*						
	- Vegetable	2.56	0.19	0.48	4.54	0.18	0.69
	- Tofu residue	0.26	0.4	0.1			0
	- Wine dregs	0.2	0.4	0.08			0.11
3.	Fuel			0.15			0.21
4.	Miscellaneous material cost			0.03			0.05
5.	Veterinary and medicine cost			0.04			0.19
6.	Depreciation of hog house			0.13			0.19
7.	Labour cost			1.99			
7.1	Family labour	0.2		1.99			
7.2	Hired labour			0			
8.	Interest paid on loans			0			
9.	Land rent (if had)			0			
10.	Mating cost *1			-			0.12
11.	Depreciation of mother pig *1			-			0.73
12.	Others			0			0
13.	Total cost			8.78			7.67
14.	Average selling price (1000VND/kg)			8.38			11.85
15.	Income			-0.39			4.27
16.	Estimated profit			-2.38			-

Source: Same as Table 4.1

Note: The same as the table 4.8

: "Family labour" may not be showed since we need to check more about the reliability of the data.

*1: Items numbered 10 and 11 are calculated for breeding swine only.

Table 4.11 Costs of raising pig in 1999 in An Giang province

Unit: per kg

Items		Fattened swine			Breeding swine		
		Volume	Price VND	Value 000 VND	Volume	Price VND	Value 000 VND
1	***Breeding swine***			5.46			
2	***Feed costs***						
2.a	*Processed feeds*						
2.1	**Broken rice**			0.57			1.93
2.1.1	Purchased	0.26	976.1	0.57	1.11	934.07	1.93
2.1.2	Family owned			0			0
2.2	**Bran**			2.05			2.1
2.2.1	Purchased	2.80	717.6	2.01	2.93	717.6	2.1
2.2.2	Family owned	0.04		0.04			
2.3	**Maize**			0			
2.3.1	Purchased						
2.3.2	Family owned						
2.4	**Sweet potato**			0			
2.4.1	Purchased						
2.4.2	Family owned						
2.5	**Industrially produced feeds**			0.48			1.38
2.5.1	Purchased	0.12	3277.25	0.48	0.25	5500	1.38
2.5.2	Family owned			0			
2.6	**Other ( )**						1.72
2.6.1	Purchased						
2.6.2	Family owned						
2.b	*Raw feeds*						
	- Vegetable	0.21	0.5	0.11			0.09
	- Tofu residue			0			0
	- Wine dregs			0			0
3.	Fuel			0			0
4.	Miscellaneous material cost			0.08			0.88
5.	Veterinary and medicine cost			0.08			0
6.	Depreciation of hog house			0.07			0.89
7.	Labour cost						
7.1	Family labour						
7.2	Hired labour			0			0
8.	Interest paid on loans			0.17			0.39
9.	Land rent (if had)			0			0
10.	Mating cost *1			-			0.39
11.	Depreciation of mother pig *1			-			0.28
12.	Others						0.07
13.	Total cost			9.07			13.01
14.	Average selling price (1000VND/kg)			13.21			21.84
15.	Income			4.87			9.24
16.	Estimated profit			-			-

Source: Same as Table 4.1

Note: The same as the table 4.8

: "Family labour" is not showed in this table since we need to check more about the reliability of the data.

*1: Items numbered 10 and 11 are calculated for beeding swine only.

Table 4.12 Costs of aquaculture production in 1999

Unit: per kg product

		Ninh Binh			An Giang		
		Volume	Price 000VND	Value 000 VND	Volume	Price VND	Value 000 VND
1	***Breeding fish***			2.27			1.72
2	***Feed cost***						
2.1	**Bran**			0.75			
2.1.1	Purchased	0.28	1.77	0.49	0.85	276.09	2.26
2.1.2	Family owned	0.2	1.77	0.26			
2.2	**Powdered fish**						0.71
2.2.1	Purchased				0.73	1417.92	0.71
2.2.2	Family owned						0
2.3	**Broken rice**						0.75
2.3.1	Purchased				0.38	1367.18	0.75
2.3.2	Family owned						0
2.4	**Industrial produced feed**						2.113
2.4.1	Purchased						
2.4.2	Family owned						
2.5	**Vegetable**			0.34			
2.6	**Others**			0.29			1.5
3.	Fuel	0.01	3.6	0.04			0.07
4.	Miscellaneous material cost			0.01			0
5.	Veterinary cost			0			0.08
6.	Depreciation of cage, machines			0.02			0.13
7.	Labour cost						
7.1	Family labour	0.19	12.38	2.32			
7.2	Hired labour			0			0.15
8.	Interest paid on loans			0			0.18
9.	Land rent			0			0.07
10.	Others			0.03			0.05
11.	Total cost exclusive of family labour cost			3.76			9.8
12.	Average selling price (1000VND/kg)			8.2			11.95
13.	Income			4.15			2.15
14.	Estimated profit			1.83			-

Source: Same as Table 4.1

Note: The same as the table 4.8

: "Family labour" may not be showed since we need to check more about the reliability of the data.

Table 4.13 Primary income source of surveyed households

(Number of household)

Province	Commune	Primary income source									
		Total	Agri-culture	Non-agri-culture total	Trade and service	Home industry	Pro-fesional occupa-tion 1/	Salary	Daily labor	Pension and social security	Others
Ninh Binh	Ninh Phong										
	1996	50	35	15	3	6	-	-	-	3	3
	1999	50	29	21	2	2	6	9	1	1	0
	Ninh Thang										
	1996	50	46	4	2	-	-	1	1	-	-
	1999	50	25	25	5	3	2	3	1	7	4
An Giang	Vinh Binh										
	1996	50	31	19	11	-	-	5	3	-	-
	1999	50	29	21	7	0	0	4	6	0	4
	An Chau										
	1996	50	36	14	5	2	-	6	1	-	-
	1999	50	18	32	7	2	1	11	10	0	1

Source: JICA-MPI survey in May of year 2000

1/ In survey in 2000, we newly added 'Professional occupation', which includes teacher, medical staff, engeneer and so on

Table 4.14 Income structure of surveyed households (total of 50 households in each commune)

(1000 dong)

Commune	Items	Rice	Other food crops	Vegetable and fruit	Other crops	Total crop cultivation	Hog	Cattle	Poutry	Eggs	Pigs for breeding	Other live-stock	Total live-stock
Ninh Phong (Ninh Binh)	Total income of suveyed households under each category	140,775	834	26,769	5,252	173,630	19,650	0	6,360	0	0	3,230	29,240
	Ratio in total (%)	35.8	0.2	6.8	1.3	44.2	5.0	0.0	1.6	0.0	0.0	0.8	7.4
	No. of household under each category	50	7	29	11	50	41	0	8	0	0	2	42
	No. of households in the red	0	0	0	0	0	11	0	0	0	0	0	10
	Ratio of income (%) (income/total output value)	60	59	82	78	63	11	N/A	27	N/A	N/A	13	13
Ninh Thang (Ninh Binh)	Total income of suveyed households under each category	131,035	40	676	200	131,751	-7,190	1,100	4,080	1,300	0	11,720	11,010
	Ratio in total (%)	32.7	0.0	0.2	0.0	32.9	-1.8	0.3	1.0	0.3	0.0	2.9	2.8
	No. of household under each category	50	1	2	1	50	47	1	2	1	0	3	47
	No. of households in the red	0	0	0	0	0	31	0	0	0	0	26	0
	Ratio of income (%) (income/total output value)	54.7	44.4	92.6	N/A	N/A	-6.4	33.3	71.2	81.3	N/A	91.6	8.1
Vinh Binh (An Giang)	Total income of suveyed households under each category	495,945	0	0	0	495,945	6,114	0	12,000	0	2,324	0	8,438
	Ratio in total (%)	56.9	0.0	0.0	0.0	56.9	0.7	0.0	1.4	0.0	0.3	0.0	1.0
	No. of household under each category	34	0	0	0	34	4	0	1	0	1	0	6
	No. of households in the red	1	0	0	0	1	1	0	0	0	1	0	1
	Ratio of income (%) (income/total output value)	58	N/A	N/A	N/A	N/A	23	N/A	N/A	N/A	N/A	N/A	N/A
An Chau (An Giang)	Total income of suveyed households under each category	320,288	0	9,000	25,552	354,840	24,459	350	8,030	42,524	23,701	0	99,063
	Ratio in total (%)	24.5	0.0	0.7	2.0	27.2	1.9	0.0	0.6	3.3	1.8	0.0	7.6
	No. of household under each category	29	0	4	3	31	4	1	5	1	3	0	10
	No. of households in the red	0	0	0	0	0	0	1	1	0	0	0	1
	Ratio of income (%) (income/total output value)	56	N/A	N/A	91	N/A	45	5	21	76	55	N/A	N/A

Source: JICA-MPI survey in May of year 2000

1/ In same individual household' data, handicraft and service are not devided but combined together, which make us unable to define the exact data on each category.

Fish culture in ponds	Fish culture in cages	Other kinds	Fish Capture	Total fishery	Handi-craft	Service	Total of Handicraft and service 1/	Wages and salaries		Public pen-sion benefits	Social secu-rity benefits	Gift	Interest on deposit	Other	Total income	Per household
								Constant	Temporary							
11,603	0	0	0	11,603	52,840	9,993	111,173	18,452	17,560	16,800	10,485	0	2,600	1,528	393,071	7,861
3.0	0.0	0.0	0.0	3.0	13.4	2.5	28.3	4.7	4.5	4.0	2.7	0.0	0.7	0.4	100.0	-
14	0	0	0	14	6	7	20	5	6	4	7	0	2	2	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0
51	N/A	N/A	N/A	51	37	20	45	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2,430	0	0	0	2,430	1,000	0	118,545	43,260	15,500	51,514	17,078	0	3,370	5,724	400,182	8,004
0.6	0.0	0.0	0.0	0.6	0.2	0.0	29.6	10.8	3.9	13.0	4.3	0.0	0.8	1.4	100.0	-
10	0	0	0	10	2	0	30	8	12	12	8	0	1	6	0	-
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
60.9	N/A	N/A	N/A	60.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
45,362	0	18,000	23,020	86,382	20,520	152,670	173,190	49,922	37,028	0	4,600	0	0	4,320	871,825	17,196
5.2	0.0	2.1	2.6	9.9	2.4	17.5	19.9	5.7	4.2	0.0	0.5	0.0	0.0	0.5	100.0	-
12	0	1	9	20	3	16	18	8	12	0	1	0	0	1	-	-
5	0	0	9	4	0	0	0	0	0	0	0	0	0	0	-	-
19	N/A	55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
24,427	621	0	0	25,048	332,250	169,975	506,725	181,116	111,336	17,760	6,888	3,500	0	0	1,306,276	26,126
1.9	0.0	0.0	0.0	1.9	25.4	13.0	38.8	13.9	8.5	1.0	0.5	0.3	0.0	0.0	100.0	-
15	1	0	0	16	10	17	24	14	21	3	4	2	0	0	-	-
2	0	0	0	3	0	0	0	0	0	0	0	0	0	0	-	-
20	64	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 4.15 Income structure of household by yearly income quintile groups [1]/

Commune	Unit	Quintile groups	Crop Cultivation Total	Live-stock total	Fishery total	Handicraft and service total	Salary	Wage	Others[2]/	Total income
Ninh Phong (Ninh Binh) 50HH	Income (1000 dong)	I	10,011	-6,134	1,490	2,200	0	0	4,272	11,839
		II	34,584	1,351	1,146	320	0	400	1,728	39,529
		III	41,032	8,923	2,523	9,700	0	3,780	1,000	66,958
		IV	44,196	16,023	3,108	20,258	4,296	2,400	4,408	94,689
		V	43,808	9,077	3,336	78,695	14,156	10,980	20,005	180,057
		Total	173,630	29,240	11,603	111,173	18,452	17,560	31,413	393,071
	% in HH's total income	I	85	-52	13	19	0	0	36	100
		II	87	3	3	1	0	1	4	100
		III	61	13	4	14	0	6	1	100
		IV	47	17	3	21	5	3	5	100
		V	24	5	2	44	8	6	11	100
		Total	44	7	3	28	5	4	8	100
Ninh Thang (Ninh Binh) 50HH	Income (1000 dong)	I	17,753	-6,600	0	3,140	0	3,220	3,528	21,041
		II	29,108	-85	716	2,080	0	2,800	6,944	41,563
		III	27,807	1,910	324	11,800	13,140	3,500	12,624	71,104
		IV	31,962	6,868	0	36,365	3,600	3,600	17,014	99,408
		V	25,122	8,918	1,390	65,160	26,520	2,380	37,576	167,066
		Total	131,751	11,010	2,430	118,545	43,260	15,500	77,686	400,182
	% in HH's total income	I	84	-31	0	15	0	15	17	100
		II	70	-0	2	5	0	7	17	100
		III	39	3	0	17	18	5	18	100
		IV	32	7	0	37	4	4	17	100
		V	15	5	1	39	16	1	22	100
		Total	33	3	1	30	11	4	19	100
Vinh Binh (An Gaing) 50HH	Income (1000 dong)	I	-7,322	0	-24,139	13,970	7,920	2,718	0	-6,852
		II	24,597	2,324	618	9,300	11,330	11,460	0	59,629
		III	59,462	-4,240	17,750	17,200	0	22,850	0	113,022
		IV	117,052	1,920	25,540	50,500	4,656	0	4,320	203,988
		V	302,156	20,434	66,613	82,220	26,016	0	4,600	502,039
		Total	495,945	20,438	86,382	173,190	49,922	37,028	8,920	871,825
	% in HH's total income	I	107	0	352	-204	-116	-40	0	100
		II	41	4	1	16	19	19	0	100
		III	53	-4	16	15	0	20	0	100
		IV	57	1	13	25	2	0	2	100
		V	60	4	13	16	5	0	1	100
		Total	57	2	10	20	6	4	1	100
An Chau (An Gaing) 50HH	Income (1000 dong)	I	13,333	305	-3,159	10,200	0	26,980	2,720	50,379
		II	15,883	5,795	-3,334	24,450	22,896	28,406	13,800	107,895
		III	53,802	3,077	9,045	33,350	28,560	42,450	3,564	173,848
		IV	147,440	8,948	25,100	60,125	13,860	2,000	864	258,338
		V	124,381	80,939	-2,604	378,600	115,800	11,500	7,200	715,816
		Total	354,840	99,063	25,048	506,725	181,116	111,336	28,148	1,306,276
	% in HH's total income	I	26	1	-6	20	0	54	5	100
		II	15	5	-3	23	21	26	13	100
		III	31	2	5	19	16	24	2	100
		IV	57	3	10	23	5	1	0	100
		V	17	11	-0	53	16	2	1	100
		Total	27	8	2	39	14	9	2	100

Source: JICA-MPI survey in May of year 2000

1/ Quintile groups are in increasing order from I to V with each including 10 households.

2/ The category of 'Others' includes pension, social security benefit, gift, interest on deposit and so on.

Table 4.16 Structure of commercial paddy farm households

Pro-vince	Commune	Non-paddy farm household	Non-commercial paddy farm house-hold	Commercial paddy farm household (kg)					Un-known	Total
				Less than1000 (Less than 500)	~5000	~10000	~30000	Over 30000		
NB	NP: Number of household	0	18	21 (14)	11	0	0	0	0	50
	: Ratio in total production (%)	0.0	32.8	38.8	28.4	0.0	0.0	0.0	0.0	100.0
	: Ratio in total sales volume (%)	0.0	0.0	26.3	73.7	0.0	0.0	0.0	0.0	100.0
	NT: Number of household	0	17	27 (15)	7	0	0	0	0	50
	: Ratio in total production (%)	0.0	29.0	53.6	17.4	0.0	0.0	0.0	0.0	100.0
	: Ratio in total sales volume (%)	0.0	0.0	60.8	39.2	0.0	0.0	0.0	0.0	100.0
AG	VB: Number of household	17	3	1 (1)	6	7	11	4	1	50
	: Ratio in total production (%)	0.0	1.4	0.2	4.2	12.5	42.7	39.0	-	100.0
	: Ratio in total sales volume (%)	0.0	0.0	0.1	3.0	11.9	44.3	40.7	-	100.0
	AT: Number of household	21	4	2	11	5	4	3	0	50
	: Ratio in total production (%)	0.0	1.5	1.8	16.2	13.4	40.6	26.5	0.0	100.0
	: Ratio in total sales volume (%)	0.0	0.0	0.5	11.3	12.6	45.3	30.3	0.0	100.0

Source: JICA-MIP survey in May of year 2000

Note: NP, NT, VB and AT are abbreviations for Ninh Phong, Ninh Thang, Vinh Binh and An Chau, respectively.

Table 5.1 Number of borrowed households and average lending amount per surveyed household by financing institution in 1999

(No. of households, million dong)

Province	Commune	Formal finance						Informal finance					Total No. of borrowed households
		VBA	PCF	VBP	RSB	Others	Total	Relatives	Friends	Money lenders	ROSCAs	Total	
Ninh Binh (The North)	Ninh Phong	0	4	2	0	1	7	0	0	0	0	0	7
		0	*1.75*	*1.5*	*0*	*3*		*0*	*0*	*0*	*0*	*0*	
	Ninh Thang	6	1	6	0	1	13	2	1	0	0	2	14
		6.33	*2*	*2.25*	*0*	*1*		*5*	*2*	*0*	*0*		
An Giang (The South)	Vinh Binh	28	0	2	0	0	30	0	2	3	0	4	30
		7.8	*0*	*2*	*0*	*0*		*0*	*4.8*	*5.8*	*0*		
	An Chau	14	0	6	2	1	23	0	1	1	0	2	25
		7.5	*0*	*2.9*	*1.8*	*13.5*		*0*	*0.3*	*9*	*0*		
Total		48	5	16	2	3	73	2	4	4	0	8	76
		7.5	*1.8*	*2.4*	*1.8*	*5.8*		*5*	*3*	*6.6*			

Source: Same as Table 4.1

Table 5.2 Number of borrowed households and average lending amount per surveyed household by financing institution in 1996

(No. of households, million dong)

Province	Commune	Formal finance						Informal finance					Total No. of borrowed households
		VBA	PCF	VBP	RSB	Others	Total	Relatives	Friends	Money lenders	ROSCAs	Total	
Ninh Binh (The North)	Ninh Phong	8	3	3	1	0	12	3	1	0	0	4	13
		5.6	*2*	*0.6*	*9*	*0*	*5.1*	*0.5*	*6*	*0*	*0*	*1.9*	*5.3*
	Ninh Thang	15	0	5	0	0	18	2	2	1	0	5	22
		1.4	*0*	*0.7*	*0*	*0*	*1.3*	*3*	*1.3*	*5.2*	*0*	*5*	*1.7*
An Giang (The South)	Vinh Binh	38	0	6	4	0	41	5	2	8	0	14	44
		11.1	*0*	*1.7*	*6.5*	*0*	*11.1*	*8.6*	*40*	*5.9*	*0*	*12.1*	*14.2*
	An Chau	27	0	3	1	3	32	0	0	0	1	1	33
		5.8	*0*	*1.9*	*7.5*	*2.8*	*5.6*	*0*	*0*	*0*	*2*	*2*	*5.5*
Total		88	3	17	6	3	103	10	5	9	1	24	112
		7.3	*2*	*1.4*	*7.1*	*2.8*		*4.1*	*2.9*	*5.9*	*2*		

Source: Same as Table 4.1

Note: The average lending amount per surveyed household in 1996 in the row "total" is the average amount over the original sample of 300 households.

Table 5.3 Sources and purposes of loans in 1999

Units: Household, %.

		VBA	VBP	PCF	RSBs	Others	Formal loan	Relative	Friends	Moneylenders	ROSCA	Informal loan	Total
Agriculture	Cultivation	18	1			1	20		1	2	0	3	23
		37.5	6.3	0.0	0.0	33.3	27.0	0.0	25.0	50.0	-	30.0	27.4
	Livestock	4	8	4	2		18			2	0	2	20
		8.3	50.0	80.0	100.0	0.0	24.3	0.0	0.0	50.0	-	20.0	23.8
	Aquaculture	1	1				2				0	0	2
		2.1	6.3	0.0	0.0	0.0	2.7	0.0	0.0	0.0	-	0.0	2.4
	Others						0				0	0	0
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0
	Subtotal	23	10	4	2	1	40	0	1	4	0	5	45
		47.9	62.5	80.0	100.0	33.3	54.1	0.0	25.0	100.0	-	50.0	53.6
Others than Agriculture	Sideline	1	1	1			3				0	0	3
		2.1	6.3	20.0	0.0	0.0	4.1	0.0	0.0	0.0	-	0.0	3.6
	Traders & Services	8	3			1	12	2	1		0	3	15
		16.7	18.8	0.0	0.0	33.3	16.2	100.0	25.0	0.0	-	30.0	17.9
	Others						0				0	0	0
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0
	Subtotal	9	4	1	0	1	15	2	1	0	0	3	18
		18.8	25.0	20.0	0.0	33.3	20.3	100.0	25.0	0.0	-	30.0	21.4
Consumption	Houses	15	2			1	18		1		0	1	19
		31.3	12.5	0.0	0.0	33.3	24.3	0.0	25.0	0.0	-	10.0	22.6
	Others	1					1		1		0	1	2
		2.1	0.0	0.0	0.0	0.0	1.4	0.0	25.0	0.0	-	10.0	2.4
	Subtotal	16	2	0	0	1	19	0	2	0	0	2	21
		33.3	12.5	0.0	0.0	33.3	25.7	0.0	50.0	0.0	-	20.0	25.0
Total household by borrowing purposes		48	16	5	2	3	74	2	4	4	0	10	84
		100	100	100	100	100	100	100	100	100	100	100	100
Total No. of borrowing HHs		48	16	5	2	3	74	2	4	4	0	10	*76*

Source: Same as Table 4.1

Table 5.4 Sources and purposes of loans in 1996

Units: Household, %.

		VBA	VBP	PCF	Commercial banks	Public fund	Formal loan	Relative	Friends	Moneylenders	ROSCA	Informal loan	Total
Agriculture	Cultivation	42	4	-	2	-	48	5	1	4	-	10	58
		41.2	7.1	-	33.3	-	28.1	31.3	16.7	36.4	-	28.6	28.2
	Livestock	38	48	1	2	3	92	2	2	2	1	7	99
		37.3	85.7		33.3	75.0	53.8	12.5	33.3	18.2	50.0	20.0	48.1
	Aquaculture	3	-	-	1	1	5	3	1	2	-	6	11
		2.9	-	-	16.7	25.0	2.9	18.8	16.7	18.2	-	17.1	5.3
	Others	-	1	1	-	-	2	-	-	-	-	-	2
		-	1.8	33.3	-	-	1.2	-	-	-	-	-	1.0
	Subtotal	83	53	2	5	4	147	10	4	8	1	23	170
		81.4	94.6	66.7	83.3	100.0	86.0	62.5	66.7	72.7	50.0	65.7	82.5
Others than Agriculture	Sideline	3	1	1	-	-	5	1	-	-	-	1	6
		2.9	1.8	33.3	-	-	2.9	6.3	-	-	-	2.9	2.9
	Small Traders	3	-	-	-	-	3	-	1	1	-	2	5
		2.9	-	-	-	-	1.8	-	16.7	9.1	-	5.7	2.4
	Others	1	-	-	-	-	1	-	-	-	-	-	1
		1.0	-	-	-	-	0.6	-	-	-	-	-	0.5
	Subtotal	7	1	1	-	-	9	1	1	1	-	3	12
		6.9	1.8	33.3	-	-	5.3	6.3	16.7	9.1	-	8.6	5.8
Consumption	Houses	11	-	-	-	-	11	3	-	-	-	3	14
		10.8	-	-	-	-	6.4	18.8	-	-	-	8.6	6.8
	Others	-	-	-	-	-	-	2	1	2	-	5	5
		-	-	-	-	-	-	12.5	16.7	18.2	-	14.3	2.4
	Subtotal	11	-	-	-	-	11	5	1	2	-	8	19
		10.8	-	-	-	-	6.4	31.3	16.7	18.2	-	22.9	9.2
Others, Unspecify		1	2	-	1	-	4	-	-	-	1	1	5
		1.0	3.6	-	16.7	-	2.3	-	-	-	50.0	2.9	2.4
Total household by borrowing purposes		102	56	3	6	4	171	16	6	11	2	35	206
		100	100	100	100	100	100	100	100	100	100	100	100
Total No. of borrowing HHs		90	56	3	6	4	159	16	6	9	2	33	157

Note: This table is reproduced from Toshihiko Suda (1997). Figures are compiled included those observations from Quang Ngai province.

Table 5.5 The situation about mass organizations in surveyed communes

	Ninh Binh	An Giang
1, Participating in mass organization	81	32
2, Mass organizations in economic activities		
- Very need	79	13
- Need	4	24
- No need	0	5
- No opinion	0	15
Total responses	83	57

Source: Same as Table 4.1

Table 5.6 The situation about cooperatives in surveyed communes

	Ninh Binh	An Giang
1, Are there cooperatives in the commune (yes)	88	0
- Do the coopeartive (s) service for their members? (yes)	88	0
If yes, which service do the cooperative do:		
- Seed	83	0
- Agricultural inputs	82	0
- Plant protection	84	0
- Earth working	4	0
- Irrigation	87	0
- Marketing	0	0
- Others	11	0
- The opinion of the family on the cooperative services: good	78	0
2, The necessity of having cooperatives		
- Very need	83	3
- Need	2	16
- No need	0	13
- No opinion	0	20
Total responses	85	52

Source: Same as Table 4.1

Table 5.7 Agricultural extension

	An Giang	Ninh Binh
- The family is guided to use new varieties	44	85
- The family is guided on farming methods	40	83
- The family is guided on the IPM method	49	77
- Family cultivates new varieties with high yield	22	82
- Percentage of area with new varieties in total	38	70
- Family raises livestock with new breeding	6	78
- Family raises livestock using mixed feeding	7	53

Source: Same as Table 4.1

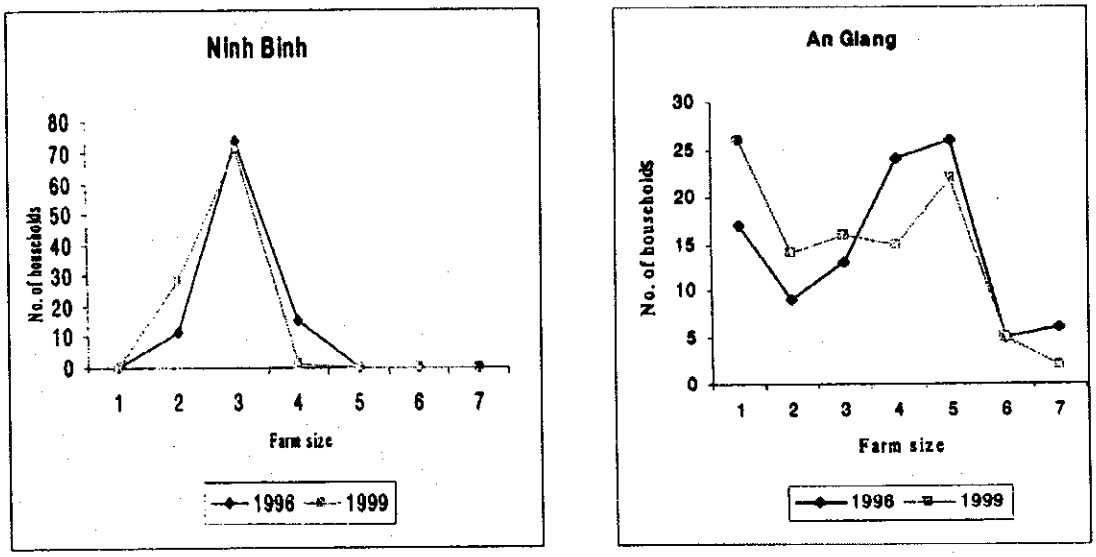
Table 6 Component of household income (%)

Village	Crop	Livestock	Fish farming	Handicraft and services	Wage and salaries	Others
Ninh Phong	44.2	7.4	3.0	28.3	9.2	7.9
Ninh Thang	32.9	2.8	0.6	29.6	14.7	19.4
Vinh Binh	56.9	1.0	9.9	19.9	9.9	2.4
An Chau	27.2	7.6	1.9	38.8	22.4	2.1

Note: 1) Based on questionnaires.

2) The figures are percentage share of each item in the total income of whole surveyed households

Figure 1 Changes in the distribution pattern of rural household by farming size between 1996 and 1999



Note: For 'Farm size' axis: 1. Landless; 2. < 0.2 ha; 3. From 0.2 - 0.5 ha; 4. From 0.5 - 1 ha 5. From 1 - 3 ha; 6. From 3 - 5 ha; and 7. From 5 - 10 ha.

Source: Based on the household survey data

2 − 3

Structural Transformation in Land Use in Red River Delta

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Land is a sensitive matter for agricultural households. The Communist Party and Government have, since a long time ago, paid much attention to landholding of agricultural households. Thus, land policies have been continuously renovated and perfected. It is noteworthy that, the policy, by which, farmers were awarded land and received certificate of the right to use land, has actively stimulated agricultural households to speed up their activities. Consequently, the agricultural sector has achieved a relatively steady and significant growth rate.

In Red River delta (RRD), there is not much agricultural land marked by the lowest agricultural land per capita comparing to the whole country. Additionally, a high population density and a rapid increase in agricultural labor force have resulted in the increasingly serious under-employment situation. In RRD, the land market has initially formed. Land accumulation has taken place under various forms such as transfer, leasing and land use bidding in some localities, especially in developing commercial agricultural production region. The accumulation of land has facilitated agricultural diversification, labor force re-allocation, job creation, agricultural households' income improvement and so forth.

1. Advantages and disadvantages of RRD affecting to structural transformation in land use

RRD includes 9 provinces and cities: Hanoi Capital, Hai Phong city, Ha Tay, Hai Duong, Hung Yen, Ha Nam, Nam Dinh, Ninh Binh, Thai Binh provinces. It has a total natural area of 1251 km^2, accounting for 8.3% the country area. Its population was 14.8 million people (in April 1999), sharing 19.39% of the country's population. As a result, RRD has the highest population density of 1182 persons/km^2.

1.1 Advantages

Geographically, the region is in a greatly advantageous location with Hanoi Capital, many cities and town, airport, important harbors linked with Asian countries, which facilitate commodity transaction. Many important traffic routines are found in RRD, which acts as a linkage between regions, especially Northern Mountain and North Central Coast. RRD also is located in an active dynamic economic development region of Asia-Pacific Ocean region that has a very high and active economic growth rate. It also belongs

to the economic triangle region (Hanoi - Hai Phong - Quang Ninh) that has attracted much attention of abroad investors.

In addition, the region contains rich potentials shown by diversified and copious land and climate. In term of land, there are seven categories used for agricultural purposes, in which alluvial soil - 58.48% and yellow-red soil - 15.56%. As regard to ecology balance and sustainable development, the National Institute for Agricultural Planning and Projection specified that in RRD about a total of 589.1 thousand hectares are suitable for rice cultivation, of which 56.65% very suitable; 39.28% suitable) and 65.9 thousand hectares are suitable to other crops and annual industrial crops (21.7% very suitable, 7% more suitable and over 70% less suitable). Generally the region has a quite even and flat terrain with the elevation ranging from 2m to 17m above the sea level and an average slope of 15-20 cm per km length. In this sense, RRD can be divided into three sub regions: (i) North region: quite high topography, light-textured and easily drained soil; (ii) Center region: relatively low terrain and hardly drained soil; (iii) Coastal region: high terrain, easily drained soil, which is very suitable for intensive cultivation especially food crop. RRD is characterized by tropical and sub-tropical, monsoon climate with an annual average rainfall of 1600-1700 ml. It is endowed with an abundant water resources, both surface water and groundwater. There is a cold winter season with the temperature of about 15-17^{0}C, which is very suitable for growing high value winter cops for export.

Regarding labor force: In RRD, there is nearly 8.6 million people in working age, in which rural employers occupy 6,082 million people, accounting for 70.73% of the labor force. In general it is the young population that includes 70.73% people in age of 15-40. Educational level of the population is higher than that in others, shown by 53% of total population had finished primary and secondary schools whereas 30% is the respective rate in the whole country. RRD contributes to 53% of total numbers of cadres engaged in science & technology research, 52% of post-graduated, 56% of graduated: 36.7% of college degree and 57% of high skilled workers in the whole country. For the time being, 64% of universities and colleges as well as most of research institutes and leading scientific centers are situated in the region.

The region is also the origin of water rice cultivation, one of several plant seed centers of the world, the alluvial soil region rank second in area after Mekong River delta over the country. Rate of irrigated land is the highest, shown by 79.1% arable land is irrigated and 66.7% in time drained, whereas 41.3% and 30.3% are the rate of arable land, which is irrigated and drained respectively in the whole country. Historically, the region also has a long tradition of water rice intensive cultivation with the highest level compared with the whole country. Advanced science and technologies are increasingly applied to the agricultural production. Besides rice cultivation, other crops such as jute, mulberry and animal breeding occupy a large proportion.

Moreover, RRD is a location of many industries that have relatively developed industrial structures. Craft and traditional industry villages are quite developed, which support agricultural sector by attracting abundant employers and increasing income of households.

1.2 Disadvantages

Besides above-mentioned advantages, the RRD is also exposed to several disadvantages restricting the socio-economic development in general and the development of agriculture in particular, as follows:

The region has a high population density but the lowest level of agricultural land per capita. As a result, the region hardly ensures the agricultural production enough for local food consumption demand. On the other hand, it is facing with the very strong pressure of underemployment. Given the small agricultural land area, which has mostly been exploited since a long time ago with highly intensive cultivation, its capacity for agricultural production is nearing to reach the ceiling.

The RRD is also constrained by a low level of starting point for production. Gross output of agriculture (at current price) of the region shares 18.92% that of the whole country and 57.08% that of the Mekong River Delta. Similarly, gross output of the industry sector contributes 16.61% that of the whole country and shares 32.09% that of the Southeast region. In detail, gross output of all state owned industries, non-state industries and FDI related industries are lower than those of the Southeast region. Materials-technique bases are obsolete, and slowly upgraded. Moreover, the region is coping with the poor condition in infrastructure especially the road network, and a serious shortage of suitable means of transportation such as medium and large ones.

For ten years of economic renovation, the economic ownership structure has been slowly transformed. So far, state enterprises have operated ineffectively. The collective economic sector especially cooperatives, though transformed by the Law on cooperatives, has been perplexed. The private sector has developed only in embryo. Joint ventures of state-owned enterprises and foreign investment have just developed recently. The economic mechanism has been sluggishly transformed to market mechanism restricting economic dynamics and competitiveness of economic activities in the region.

To some extent, the market mechanism has been unshaped, shown by the fact that many people have not responding to business activities in the market economy. Overseas markets for domestic commodities have been reshaped but developed unsteadily. In the agricultural sector, the marketing are facing huge difficulties such as a rapid reduction in output product prices that negatively influence to farmer's income, although the agriculture has initially changed to commercial production.

Such limitations are blamed for the slow structural transformation in region's economy in general, in agriculture in particular especially in the land use situation. So far, agricultural sector has dominated a large proportion in GDP of the region while non-agricultural activities have underdeveloped. Although several laws and law codes provisions have been issued and revised, there is still a lack of timely suitable policies to be institutionalized to create the convenience in economic environment and legal framework to boost the development of all economic sectors equally, especially the household economy, rural industry and services as well as to create job opportunities in rural area as the ideal of *"move out of agricultural activities but not out of village"*. Additionally, the close relation between different economic ownership in

rural areas, which is necessary for the strengthening and development of cooperatives, has not yet been established.

2. The implementation of land allocation and granting certificate of the right to use land

2.1 Before 1993

Having finished the land reform with a slogan "land to tiller", land was distributed to agricultural households, private sector and as a result, the self-sufficiency peasant model was gradually formed. In 1958, the Communist Party and Government conducted cooperativization in agriculture. By 1960, basically agricultural households were organized in agricultural cooperatives, that in fact was the implementation of extreme collectivization of land, labor force and other material technique base.

Land was collectively owned, and household economy disappeared and was dissolved into cooperative economy. Agricultural households became cooperative's members under the control of a management board. After the reunification of the country in 1975, in a short time of experimental implementation, in the South, cooperative movement was speeded up applying the same model of the North. Almost all agricultural households were organized into production group—a loose collective production model in agriculture in the South.

In this period, inherit constraints of such collective cooperatives that had been hidden in the war initially exposed, such as bureaucratic management regardless of labor benefits, which greatly contributed to the economic recession between 1976 and 1980.

To overcome this gloomy situation, Resolution 100 (dated January 13th 1981) was issued by the Political Bureau, in which a system of three contracts (output contract, working point contract, production cost contract to agricultural households) was changed to the overall contract based on a system to labor and group of labor. The production relationship in agriculture was slightly adjusted by a mechanism through which: (i) land was assigned to agricultural households for cultivation; (ii) cooperatives were in charge of five stages of the agricultural production; (iii) cooperative's members were in charge of three stages and responsible for delivering agro-products up to cooperatives based on economic contract as signed with cooperative.

The renewal of land policy, although in an initial step, had resulted in the fact that agricultural households were encouraged to apply advanced cultivation technique to increase the yield of crops and livestock. However, such a motivation took effect only for a short time because the contracted output was significantly increased by cooperatives after cropping seasons. This behavior made a reduction in surplus amount of products that agricultural households have had to enjoy for their achievements. The farmer's benefit was strongly eroded. For another reason, five stages of cultivation assigned to cooperatives were carried out

insufficiently, even nothing were done, but cooperatives still requested agricultural households to strictly deliver their products as contracted. As a result, agricultural households protested against cooperatives, and refused to pay debt. Once again, the agriculture suffered from recession.

In such a context, the Policy Bureaus promulgated Resolution No. 10 (April 5, 1988) in order to basically reform the agricultural production. The Resolution stipulated that agricultural co-operatives allocated land to its members in a certain term of 10-15 years for annual crop land; of 1-2 business cycle for afforested and perennial crop land. An amount of contracted products was stabilized for a five-year duration. During the time that land was allocated, the user could transfer to others and inherit to his/her children. Agricultural households were determined as objects of land allocation. Furthermore the Resolution encourages the implementation that *"person should do a certain job that his/her are good at" because "good farmer always creates more product than others."*

Allocating land based on farmer's competence was a new and important policy to develop the commercial agriculture. Nevertheless, this mechanism were applied in the difficult situation: (i) an under-development of non-agricultural industries; (ii) an increasingly huge redundant of agricultural labor; (iii) a large proportion of poor agricultural households; (iv) a small proportion of good households (20%); and (v) the conflict between arguments of "all people can have jobs to survive" and "take up a job to which you are capable". Therefore, many localities in RRD applied the mechanism in which, the procedure of land allocation to agricultural households were separated into two sub-procedures.

First: a certain amount of land was steadily allocated to agricultural households in accordance with working skills of agricultural households, which aimed for a satisfaction of basic food consumption of agricultural households as well as for an assurance of delivered products as contracted. During this process, priority was given to war-victims, or poor agricultural households. Generally, this land occupied about 60-80% of total arable land of agricultural cooperatives. The amount of land to be assigned to each agricultural household was determined on the basis of the available land in a cooperative, number of people in the cooperative and number of people in each household.

Secondly: the rest of land that includes mainly alluvial fan, surface water like lakes, swamps, ponds etc were divided into certain plots and were allocated to households in short term contracts. However, in case of much demand, a bidding procedure on the amounts of products delivered up to cooperative was offered. The highest bidder would have right of to be assigned that land. Usually the land is awarded to households who are in favorable condition to cultivate and want to expand their production.

2.2 Land allocation by the Land Law 1993

The Land Law was approved by National Assembly (dated July 14th 1993) and concretized in detail by Government's Decrees. The Decree 64/CP that regulated on the allocation of agricultural land to households and individuals for a long-term use in agricultural production was taken effect since October 15th 1993.

Basically, the Decree reflected the legal provisions of the Law, such as: land is the property of people; the State shall allocate agricultural land and grant certificate of the right to use land to households and individuals for use on a stable and long-term basis; the State exercises the ultimate powers of administration on all purposes of land use, removes the situation of non-actual land owner, clearly defines rights and obligations of land users etc., in order to develop a commercial agricultural production bias the market economy under State's control.

The Decree also emphasizes that "the State shall allocate agricultural land to households and individuals for the purpose of agricultural production, including: annual crop land, perennial crop land, inland water surfaces for aquaculture. The objects of land allocation are households and individuals that contain agricultural employers who are permanent residents of the locality including persons who are serving in the army. In addition, the following people who have demand for using land for agricultural production are also involved: people who earn income from agricultural production are living in the locality but have not yet registered for permanent residence confirmed by commune people's committee; members of former agricultural cooperatives who used to work at craft cooperative currently are in unemployment and have demand for working in agricultural sector; children of state officers who are living in the locality in working ages and have no jobs. Commune people's committee shall verify those people's information and propose to district/town/city people's committee for approval and allocation of land.

From October 15, 1993, the duration of land allocation for annual crop cultivation and aquaculture shall be 20 years, and for perennial crop planting shall be 50 years. For annual crops, land limit is 3 hectares for a household in Mekong River delta, Southeast region, and 2 hectares for the rest of regions. For perennial crops, it is 10 hectares for delta regions, 30 hectares for midland and mountainous regions. In cases of barren hill, reclaimed land in coastal regions, the land use limit shall be determined by people's committee at provincial or city level. Land reserved for community use is defined not to exceed 5% of total agricultural land in the commune.

To implement the Decree 64/CP, all localities had conducted investigations to specify the land area of each categories, including annual crop land, perennial crop land, inland surface for aquaculture in order to reasonably allocate to households and individuals for use in long term; and to specify land sources for rental and community use.

2.3 Agricultural land allocation to agricultural households in RRD

Based on the Decree 64/CP and agricultural land availability, almost all localities allocated land to use on a long term and stable basis, namely:

Some provinces based on the land situation that used to be allocated by Resolution No. 10 to award land to agricultural households. In general, this assignment was quite reasonable in close association with regulations of the Decree 64/CP. The adjustment was undertaken in provinces in which the land allocation

not followed the Decree 64/CP and receipted an acceptance of majority of agricultural households. In Hai Duong and Hung Yen provinces, 151 communes (37%) conducted an adjustment of allocated land among households. In Ha Tay province, there were 2 districts in which agricultural land sources of 22% of households were extracted and 18% were given more.

By 1994, the land allocation had been completed in 82.8% of agricultural land area and 97.1% of households. However, some of suburbs in Hanoi and Hai Phong city were very slow in carrying out this assignment because their master plan and land use plan was not approved.

3.3 Granting certificates of the right to use land

This was a complicated job that requires detailed investigation, surveys, measure and land mapping must be worked out firstly. In case of Viet Nam, various reasons caused a slow implementation of the task, such as: obsolete equipment and facilities for measuring land and drawing land maps; financial budget constraints; agricultural land that already had been divided into very small plots resulted to a great number of land lots. Consequently the allocation of land and granting certificate of the right to use land to agricultural households was implemented slowly. At the end of 1994, although 82% of agricultural land was allocated to households but only 13.5% of which were granted the certificates. Ha Tay province, that was considered as a highlighted phenomenon, but this rate only reached to 40.5%. Other provinces is marked by the lower rate, such as Nam Ha: 15.7%; Ninh Binh 6.42%; Hung Yen 0.15%; Thai Binh and Hanoi 0%.

Given this difficult situation, the Prime Minister issued the Instruction 10/1998/CT-TTg, and Instruction 18/1999/CT-TTg to speed up allocating land and granting certificate of the right to use land. Those instructions emphasize on legally simplifying the procedures of land allocation and certificate granting. In practice, based on existing topographic maps and sketches, other related documents, land users who inform the actual situation of the land they are using and commit the truth of that information, can be granted certificate of the right to use land. As a result, the land allocation progress was accelerated. By the end of December 1999, in RRD, 2,306,303 agricultural households accounting for 82.77% of the total was granted the certificate; 462,702 hectares of agricultural land accounting for 76.27% of the total were allocated. Hai Phong, Hung Yen, Hai Duong reached 94%; 71-87% for Ha Tay, Nam Dinh, Ha Nam, Ninh Binh; 28.91% for Hanoi (40 out of 159 communes completed); 47.67% for Thai Binh (203 out of 283 communes completed). (See Table 1)

However, during the implementation, many localities did not put adequate attention to the preparation and finalization of land assigned records. So far, although a high rate of granting certificate of the right to use land was achieved, those related land documents were in shortage and non-synchronization that produced difficulties in administration of land and its changes especially in case of dispute. Moreover, in the early years of the implementation, some localities, in an attempt to accelerate the granting of certificate of right to land use to facilitate households in getting bank loans, issued temporary certificates in the form of

simple legal and technique requirements. Consequently many problems emerged during the transition period from temporary certificates to unified certificates issued by General Department of Land, restricting the implementation. Some localities used the certificate of the right to use land as a measure to recover debt of its cooperative members, resulting to the fact that although some certificates were registered but cannot be delivered to land users (12-15% of total certificates).

Table 1 Granting certificate of the right to use land to households (by December 31, 1999)

	Communes having agro-land	Communes completed certifying	Household using agro-land	Total land need to be certified	Completed granting the certificate			
					By households		By land area	
	(commune)	(commune	(households)	(ha)	Volume	%	Volume	%
RRD	1,805	1,539	2,786,394	606,868	2,306,303	82.77	462,702	76.27
In which								
1. Hanoi	159	40	195,838	42,786	62,411	31.87	12,370	28.91
2. Hai Phong	184	164	252,028	53,350	242,028	96.03	51,717	96.94
3. Hai Duong	256	256	374,481	76,520	359,102	95.89	72,258	94.43
4. Hung Yen	157	157	249,309	50,877	236,511	94.87	48,775	95.87
5. Ha Tay	317	301	466,110	95,572	415,607	89.17	83,199	87.05
6. Ha Nam	110	95	178,285	52,280	165,049	92.58	39,865	76.25
7. Nam Dinh	205	189	422,076	92,567	393,679	93.27	73,309	79.20
8. Thai Binh	283	203	429,553	87,073	228,987	53.31	41,510	47.67
9. Ninh Binh	134	134	218,714	55,714	202,927	82.78	39,699	71.32

Source: General Department of Land, 2000

3. Agricultural land availability in RRD

3.1 Agricultural land by province

RRD is characterized by a small land area and high population density. The agricultural land is 720,747 hectares, accounting for 56.92% of the natural land area. The annual crop land shares 86.15%, the mixed garden land 5.35%, the inland surface for aquaculture 6.77%, the rest is perennial crop land and grassland. Of provinces in RRD, Ha Tay, Nam Dinh, Thai Binh provinces have the largest agricultural land areas, the smallest can be seen in Hanoi and Ha Nam (see Table 2).

Rice and subsidiary food crops land shares the biggest proportion of 94.9% of total annual crop land, in which double-rice crop land contributes a considerable proportion. In 1960s, some provinces attempted to increase the cropping coefficient (calculated by dividing total crop growing area in a year by cultivated area) by the introduction of autumn rice crop, which resulted in a low yield and negatively, affected to winter rice crop's yield. Afterward, success became true when new rice varieties were applied. Long-day winter-spring rice varieties are replaced by short-day spring rice varieties, at the same time the winter crops, which become one of the main crops nowadays, are introduced. Therefore, triple-crop areas have increased rapidly and shared a large proportion comparing to that of Mekong River delta as well as to the

whole country. So far, triple-crop area shared 12.8% of total annual crop area, in particular, this rate is one-fourth in Thai Binh province (see Table 3). There are some districts in which area of winter crops contribute to a large share of total cropped areas such as Gia Lam (Hanoi) 43.5%; Ba Vi (Ha Tay province) 41.9%; Cam Binh (Hai Duong province) 36.5%. Also, the rate of double-crop area is relatively high, 20% higher than that of the whole country and Mekong River Delta. Single-crop areas has sharply reduced and contributed a small proportion, significantly, 3.8% in Thai Binh, 7.4% in Hai Phong.

Table 2 Agricultural land in RRD, 1998

Unit: ha

Land categories / Localities	Agricultural Land	Annual crop land			Mixed garden	Perennial crop land	Grass land	Inland surface for aquaculture
		Total	In which					
			Food crops	Other crop				
RRD	720,747	620,096	576,420	44,486	38,596	10,092	2,363	48,790
In which								
1. Hanoi	43,003	39,330	33,971	5,359	481	300	89	2,803
2. Hai Phong	69,877	53,313	52,313	991	7,231	288	20	9,034
3. Hai Duong	96,706	82,386	79,152	3,234	4,263	3,902	136	6,019
4. Hung Yen	60,592	55,229	50,629	4,600	1,357	313	0	3,693
5. Ha Tay	122,179	104,579	93,974	10,605	8,771	3,134	564	5,131
6. Ha Nam	52,280	44,495	40,332	4,163	2,842	598	4	4,341
7. Nam Dinh	103,034	94,354	87,825	6,529	1,379	483	166	6,652
8. Thai Binh	105,951	90,518	88,627	2,701	6,849	90	58	7,626
9. Ninh Binh	67,125	55,901	49,597	6,304	5,423	984	1,326	3,491

Source: General Department of Land, 1999.

Table 3 Annual crop structure

Unit: %

	Total	In which rice and other food-crops					Other land
		Total	triple-crop land	double-crop land	single-crop land		
					Total	upland fields	
The whole country	100.0	83.3	8.8	55.2	36.0	5.7	16.7
In which							
RRD	100.0	94.9	12.8	76.9	10.4	0.1	5.1
Hanoi	100.0	98.6	16.5	71.0	12.4	0	4.7
Hai Phong	100.0	98.6	7.7	84.9	7.4	0	1.4
Ha Tay	100.0	92.7	13.7	73.7	12.8	0.8	7.3
Hai Duong	100.0	96.0	18.0	74.3	7.7	0	4.0
Hung Yen	100.0	96.0	18.0	74.3	7.7	0	4.0
Thai Binh	100.0	96.0	24.5	71.7	3.8	0	4.0
Ha Nam	100.0	93.8	2.7	87.3	10.0	0.1	6.2
Nam Dinh	100.0	93.8	2.7	87.3	10.0	0.1	6.2
Ninh Binh	100.0	92.8	5.1	66.7	28.2	0.1	7.2
Mekong River Delta	100.0	94.8	8.5	56.8	34.6	0.3	5.2

Source: Survey by GSO, 1994

As mentioned, the RRD is characterized by a small agricultural land area, which is unevenly distributed among provinces, districts and communes. Because of difference in population density, numbers of people

per hectare varies among provinces. In Gia Lam district (Hanoi Capital) it is 16.6 persons per hectare while in Vu Ban district (Nam Dinh province) it is only 3.8; Cam Binh district (Hung Yen province): 10.21; Tien Hai district (Thai Binh province): 8.9; Hoa Lu district (Ninh Binh province): 7.9. Agricultural land per capita also varies among provinces. On average, it is 556 m^2, accounting for 1/3 that of Mekong River delta. In suburbs of Hanoi, Hai Phong cities and Ha Tay province, this indicator is lower than the average level of the region, all the rest of other provinces have the higher rate.

In the suburb of Hanoi, this indicator is only about 480m^2, in detail, the lower levels can be seen in the two closest districts: Thanh Tri: 358 m^2 ; Tu Liem: 382 m^2. Dan Phuong and Hoai Duc (Ha Tay province) are districts that have the lowest levels of approximately equal to 67.93% and 73.06% respectively in comparison with the average level of the city.

Another classification by land area per household, in RRD, the percentage of households having agricultural land area of less than 0.2 hectares is very high - seven times higher than that of Mekong River Delta, 1.64 times higher than the average level of the whole country. Especially, the rate is very high of over 60% of total households in the following districts: Thanh Tri - Hanoi: 74.45%; Dan Phuong - Ha Tay:74.4 %; Tu Liem - Hanoi: 69.56%; Hoai Duc - Ha Tay: 69.30% (see Table 4).

Table 4 Agricultural land situation in RRD

	Agricultural land		Rate of households by agro-land scale				
	per household (m^2)	Per capita (m^2)	Total	< 0.2 ha	0.2-0.5 ha	0.5-1.0 ha	>1 ha
The whole country	4,984	1,034	100	28.1	43.96	16.23	11.71
1. Mekong River delta	10,149	1,917	100	6.85	25.65	30.65	36.84
2. Red River delta	2,281	556	100	46.29	50.39	3.19	0.12
- Hanoi capital	2,119	480	100	53.03	43.99	2.92	0.06
in which: Thanh tri district	1,554	358	100	74.54	24.99	0.37	0.11
Tu Liem district	1,640	382	100	69.56	29.59	0.83	0.03
- Hai Phong city	1,997	487	100	54.09	44.71	1.12	0.08
in which: Thuy Nguyen district	1,729	399	100	65.43	32.69	0.85	0.02
- Ha Tay province	2,382	527	100	47.52	47.12	5.01	0.35
in which: Dan Phuong district	1,598	353	100	74.40	25.01	0.58	0.02
Hoai Duc district	1,717	385	100	69.30	30.03	0.6	0.08
- Hai Hung province	2,252	569	100	45.15	52.69	2.09	0.07
in which: Chau Giang district	1,823	457	100	62.68	36.37	0.7	0.25
- Nam Ha province	2,350	591	100	44.47	51.5	3.91	0.1
in which: Xuan Thuy district	2,044	493	100	53.02	45.66	1.26	0.06
Hai Hau district	2,036	531	100	51.75	47.09	1.14	0.01
- Thai Binh province	2,179	564	100	46.28	52.42	1.27	0.01
in which: Vu Thu district	1,981	514	100	54.05	45.34	0.58	0.02
- Ninh Binh province	2,749	635	100	35.2	56.25	8.28	0.26

Source: GSO, 1994

3.2 Agricultural land in different rural household groups

Since the economic renovation has taken place, the rural area in Viet Nam has shown considerable changes. Non-agricultural households have increased in number and gradually become professional non-agricultural households.

According to GSO, in 1994, in the whole country, agriculture households shared 79.58%; industry and construction households: 1.61%; service and trading households: 4.39%; others: 12.35%. In RRD, agriculture households occupied a major proportion: 91.13%; industry and construction households: 2.01% (slightly higher that of the average level of whole country); service and trading households were in the very low rate, only equal to 40.5% of the average level of the whole country and 11.98% of the Southeast region. Some provinces have the low rate of industry households, namely Thai Binh (2.18%), Hai hung (2.55%), Nam Ha (3.84%), Ha Tay (3.88%). In suburbs of Hanoi and Hai Phong cities, this rate is quite high, Hai Phong: 7.19%, in which An Hai district: 18.1%; the suburb of Hanoi: 17.12%, in which Gia Lam district: 19.51%; Tu Liem district: 31.08%.

Regarding the agricultural land allocation between different types of households: agricultural land is also assigned to non-farm households in spite of small land area, especially in RRD. Specifically, there is not much difference in indicator of agricultural land per household to be allocated between different non-agricultural household groups, such as industry, services, trading groups and agricultural households. On average, agricultural land of non-agriculture household is 27.16-39.39% in comparison with that of agriculture household. In Ha Tay, it is 38.14%-65.65%; Thai Binh: 48.76% - 62.94%; the suburb of Hanoi: 11.25% - 16.25%; the suburb of Hai Phong city: 4.11%-12.34%. In other regions, Southeast, for instance, it is 8.54%- 12.35%, in which Dong Nai province: 11.29- 17.14%; Binh Duong and Binh Phuoc provinces: 10.57%- 17.10% (see Table 5)

Table 5 Agricultural land per capita by regions and by type of household

	Ago-households		Industry household		Cons. Household		Trading household		Services households		Others	
	m^2 per capita	%	m^2 per capita	Compa. to agro-	m^2 per capita	Compa. to agro-	m^2 per capita	Compa. to agro-	m^2 per capita	Compa. to agro-	m^2 per capita	Compa. to agro-
The whole country	1,034	100	215	20.79	158	15.28	165	15.96	160	15.46	209	20.21
Southeast region	1,757	100	217	12.35	150	8.54	203	11.55	186	10.59	206	11.72
Song Be province	2,006	100	212	10.57	312	15.55	343	17.1	306	15.25	427	21.29
Dong Nai province	1,709	100	293	17.14	275	16.09	196	11.47	193	11.29	219	12.81
RRD	556	100	219	39.39	151	27.16	151	27.16	159	28.6	101	18.17
Hanoi Capital	480	100	78	16.25	59	12.29	59	12.29	54	11.25	29	6.04
Hai Phong city	487	100	20	4.11	60	12.32	42	8.62	47	9.65	31	6.36
Ha Tay province	527	100	346	65.65	243	46.11	201	38.14	272	51.61	135	25.62
Thai Binh province	564	100	275	48.76	355	62.94	292	51.77	289	51.24	151	26.77
Hai Hung province	569	100	263	46.22	257	45.17	206	36.2	223	39.19	134	23.55
Nam Ha province	591	100	130	22.84	223	37.73	183	30.96	261	44.16	170	28.76

Source: GSO, 1994

In normal sense, agricultural households of Viet Nam, even those who receive the main income from non-agricultural business, do not want to give up agricultural land. It is deeply rooted in the thought rural people especially agricultural households in RRD. They do not feel confident in earning form non-agricultural business activities for a long time because of unstable business situation. Therefore, they still keep agricultural land as a provision against risks in non-agricultural business in spite of the low efficiency in agricultural activities.

4. Structural transformation in agricultural land in RRD

As above mentioned, the agricultural land of RRD, which mainly are annual crop land, is small and in danger of strong reduction over the time. For the recent three years, the annual arable land has reduced from 626.4 thousand hectares in 1995 to 620.9 thousand hectares in 1998, in contrast, agriculture labor has increased from 4,733 thousand laborers to 4,997 thousand laborers in the same time, resulting in a reduction of agricultural land per capita in the whole region (see Table 6).

Agricultural land per capita has continuously been narrowed due mainly to the following two reasons: first, a reduction of total agricultural land; second, an increase in number of people engaged in agricultural sector. Although changes in the agricultural land use right among households in RRD are not as much as that in Mekong River delta, it appears in several forms.

Table 6 Arable land per agricultural labor in RRD

Unit: m^2/Laborer

	1995	1998
The whole region	1,323	1,213
In which:		
Hanoi:	1,219	954
Hai Phong	1,238	1,171
Ha Tay	1,223	1,139
Hai Duong	1,202	1,129
Hung Yen	1,202	1,266
Ha Nam	1,558	1,348
Nam Dinh	1,558	1,306
Thai Binh	1,253	1,151
Ninh Binh	1,889	1,557

Source: Agro-forestry-fishery statistical yearbook 1990-1998; figures on 1998 is provided by General Department of Land

4.1 Land transfer

According to a survey conducted by the Institute for Economics in three communes: Quyet Tien commune (Kien Xuong district, Thai Binh province), an agriculture commune specializing in rice cultivation; Nam Giang commune (Nam Dinh provinces), developed manufacturing agricultural tools; Thanh Xuan commune (Thanh Ha district, Hai Duong province) concentrated on commercial litchi development. The finding is

that there are differences in agricultural land per household and different production directions in three communes. The agricultural land per household in Nam Giang is the lowest (see Table 7).

Table 7 The agricultural land per household in three selected communes

Unit: m^2/household

	Quyet Tien	Nam Giang	Thanh Xuan
Total land of household	2,279	1,172	3,965
In which			
Arable land	1,886	853	2,402
Garden	210	123	1,261
Pond	183	196	302

Source: Survey conducted by the Institute for Economics, 1999.

Given the land situation, it was revealed through interview of households of the need for arable land that 39% of respondents in Quyet Tien commune - mainly intensive rice cultivation expressed their desires of more land for agriculture; 29% of surveyed households in Thanh Xuan commune need additional land to expand their production; the lowest rate of 23% of targeted household was found in Nam Giang commune. Out of 200 selected households in each commune, only a few households involved in land transfer. However, it was noteworthy that in three communes, 150 households purchased additional land, 113 households of which (56.5% of surveyed households) lived in Thanh Xuan commune. Most of them were good agricultural households, having capital and fearlessly investing into commercial production. In Quyet Tien commune, only 31 households bought additional land, mainly during 1994-1998.

In Thanh Xuan commune, within 5 years, there were 101 households (50.5% of the surveyed households) that purchased land. Since 1990 up to now only, it was revealed that 113 households (56.5% of surveyed households) have bough land. Out of land purchased households, 1.5% bought less than 360 m^2; 21% bought from 360 - 720m^2; 25.5% bought from 720 - 1440m^2; 8.5% bought from 1440 - 7200m^2. Most of them were high in income (higher than 300 thousand VND per household member per month; In the survey those people were classified into group 1). In Thanh Xuan commune: Out of 49 households in the group 1, 27 households bought more land including 14 households (28.56%) - over 360 m^2; 5 households - over 720 m^2; 8 households - over 1440 m^2: (in which there were one household bought 7200 m^2). In group 2 as defined that people having income from 180-300 thousand VND/month, there were 45 households out of total 79 households bought land with the lower scale than group 1. In the group 3 (having income from 100 to 180 thousand VND/month), 31 households bought land that accounted for 54.39% of total households in this group. Especially, several households in the groups 4 and 5 bought land with small scale in spite of their very low income (See Table 8).

Quyet Tien commune, an exclusive agricultural commune, commercial production is under-developed, therefore land transfer or purchase is not the common phenomenon. Of total 200 surveyed households, only 34 households bought land, of which low-income households bought land mainly for their living

standard improvement not for commercial production expansion. Ten households purchased less than 360m²; 12 households: 360-720m²; 10 households: 721 - 1440 m²; 2 households: 2000 - 3000m².

In Nam Giang commune, where the income level is quite high because of developed non-agricultural activities, 56.5% of surveyed households have the income per capita at 300 thousand VND/month; targeted households of less than 60 thousand VND/month accounted for only 1.5%. In spite of high income, those households do not given up their land, which is considered as fixed assets, thus, purchasing or transferring land is rarely seen.

Thus, in RRD, land transfer can be seen in area that commercial production develop, especially in places that there is a presence of high-value crops.

Table 8 Purchasing more land in Thanh Xuan commune, Thanh Ha district, Hai Duong province

	Group 1 (income > 300 thousand VND)		Group 2 (income: 180-300 thousand VND)		Group 3 (income: 100-180 VND)		Group 4 (income: 60-100 thousand VND)		Group 5 (income < 60 thousand VND)	
	House-holds	%	House-holds	%	House-holds	%	House-holds	%	House-holds	%
whole commune	49	24.5	79	39.5	57	28.5	10	5	5	2.5
In which										
1. Purchasing more land	28	57.14	45	56.96	31	54.39	6	60	3	60
2. Time of purchasing										
1990-1993	5	10.2	5	7.33	1	1.75				
1994	6	12.24	12	15.19	3	5.26			2	40
1995	5	10.2	13	16.46	7	12.28	1	10	1	20
1996	5	10.2	4	5.06	8	14.01	1	10		
1997	4	8.16	3	3.8	8	14.01	2	20		
1998	3	6.12	7	8.86	4	7.02	2			
1999			1	1.27						
3. By acreage of purchased land (in selected cases) m²										
< 360	1	2.04	2	2.54						
361-720	5	10.2	10	12.7	6	10.5	2	40	1	20
721-1440	5	10.2	6	12.7	2	7.62				
1441-2520	6	12.24	6	7.2	2	3.5				
> 2520	2	4.08	1	2						

Source: Survey by the Institute for Economics, 1999

4.2 Renting and borrowing land

Besides rice cultivation and pig breeding—traditional productive activities, in recent decades, winter crop, mainly winter vegetables with huge potential, has become a major crop in RRD. While in some European countries, in order to grow vegetables or flowers in the winter season glasshouses, heating stoves, and water supply system as well as some other complicated equipment are required, RRD is considered as a giant natural glasshouse. It is a great advantage of RRD but has not been effectively exploited. By the end of 1980s, total vegetable growing area was over 60 thousand hectares, yielding the output of nearly 1