

Chapter 3

2. The Household Economy and the Diversification of Farming in Vietnam

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Introduction

Agricultural diversification is one of the main policies and economic issues in Asian developing rice-based countries (World Bank, 1990). The economic renovation induced by the Doi-Moi policy had stimulated the rice production in Vietnam not only in terms of the expansion of cultivated area, but also in terms of the increase in yield; this is especially true in the two main rice producing deltas, namely Red River Delta and Mekong Delta. By the early 1990's Vietnam had become the third largest rice exporting country in the world and it had risen to become the second largest by 1998; however, the rice monoculture led to a variety of conflicts arising in the rice economy. First, high external inputs, such as chemical fertilizers, pesticides, etc. led to environmental deterioration and economic inefficiencies (Nguyen Van Sanh et al., 1998). Second, continuous exports of low quality rice led to sluggish and fluctuating prices and third, rice yield itself has stagnated, probably due to deteriorating soil conditions. Moreover, the living standard of rice farmers has not improved due to comparatively low incomes from rice production. In an attempt to confront these problems, double or triple rice-cropping methods, and other combinations, such as rice-fruit, rice-vegetable, rice-livestock, rice-shrimp and etc., were introduced to diversify the rice economy in the deltas (Dan Kim Son, 1998).

Agricultural diversification in rice cultivating areas means to diversify farming activities through the introduction of crops other than rice, or animals, or converting paddy fields to orchards, or to produce fruits and vegetables in upland areas. On the other hand, the diversification of the farm household economy means that farmers engage in non-farm jobs, or off-farm jobs, in order to directly gain a cash income and in general to multiply their income resources. The significance of household economy diversification is that it is considered as a means of coping with small scale of farm resources, to expand job opportunities and income generation in rural areas, and prevent the population from concentrating in urban areas.

The objectives of this section are to outline the allotment and utilization of farm resources in the deltas and to describe the existing situation of the farm household economy and in conclusion to show how the diversification of farming activities affects the improvement of the household economy.

To pursue these objectives we conducted a household economy survey on 400 selected farm households from two different sites in both deltas in 1995. One

hundred farm-households were selected by the block-sampling method from four villages. To obtain full information of farm household activities two were in the RRD (Red River Delta); the other two were in the MKD (Mekong Delta). Villages were selected by different factors, such as location, soil conditions, cropping patterns, etc..

The synopsis of farms observed

Features of the Survey Sites

Lac Dao village lies in the My Van district, Hai Hung province (currently that has been changed to the Van Lam district, Hung Yen province) in the Red River Delta; it is a plain rural village located east of the National Highway No. 5 that runs from the capital, Hanoi to the seaport city of Hai Phong. The village is only 20km from Hanoi; however, it's too difficult for farmers to ship their products because of an unpaved nasty [consider – poor] road. The population of the village is 12,557, with 3,000 households. The triple cropping method, i.e. spring-summer rice, summer-autumn rice and winter crop has been applied in 504ha of farmland. Farmers enjoy selling their products freely since the Doi-Moi renovation and that the production of vegetables, fruits, and meat has been encouraged.

Dan Phuong village, Dan Phuong district, Ha Tay province is located around 20km northwest to Hanoi city. Since Dan Phuong lies along the main road to Hanoi city, farmers are able to ship their products directly to the markets by bicycle or motorcycle. The population of the village is 8,444, with 1,698 households. Of the 345 ha of farmland, 313 ha are paddy fields. Recently, the yield of rice has increased up to 12 tons per ha, though 10 tons per ha was the previous average. The cooperative of this village encouraged farmers to grow vegetables like cucumbers and potatoes. Handicrafts, brick making, and furniture making are traditional side-jobs for the villagers.

Binh Phu village, Cai Lai district, Tien Giang province in the Mekong Delta is conveniently located along the national highway between My Tho city, capital of Tien Giang province, and Can Tho city, the center of Mekong Delta. The total area of the village is 1,644 ha, with 420 ha being orchards. As the village is endowed with seven main canals, the irrigation system is well organized; rice cultivation developed from double cropping to triple cropping and fruit production became prevalent in this area. Rice is cultivated quite intensively with the direct seeding method, chemical fertilizers and chemical pesticide application. Since environmental deterioration has become a concern for villagers recently, the village authority has recommended a diversification of rice cultivation.

Long Thang village, Ly Vung district, Dong Thap province is located in the newly reclaimed area and has changed from floating rice cultivation to a double or triple rice cropping area. In Dong Thap province, a canal reconstruction project implemented after Vietnam War has led to the average farm size being larger than other areas in the MKD. The soil condition does not permit producing crops other than rice. As

the village is located far from any urban site, job opportunities are scarce for the villagers.

Family size

The size of farm family in the South is slightly larger than it is in the * northern areas of Vietnam [note- politically I would stay away from North Vietnam and South Vietnam. Use what you like, I would suggest mixing it up by using a combination of (1) using northern areas of Vietnam, and (2) northern Vietnam, etc.] It seems that the families do not include collateral members; so on the surface the conjugal family system is dominant (see Table3-2-1).

Table3-2-1 Farming Family Member

Commune	Village	Province	Number in family							Age of Head
			Size	Male	Female	<10	10-17	18-60	>60	
Lac Dao	My Van	Hai Hung	5.1	2.5	2.6	0.8	1.3	2.8	0.3	46.4
Dan Phuong	Dan Phuong	Ha Tay	5.2	2.7	2.5	0.6	1.2	2.9	0.5	45.5
Binh Phu	Cai Lay	Tien Giang	5.8	2.7	3.1	0.7	1.3	3.2	0.5	48.7
Long Thang	Lai Vung	Dong Thap	6.6	3.2	3.4	0.9	1.6	3.8	0.5	51.4

Source: Survey data, 1995.

Landholding

It is a well-known fact that there are big difference in land tenure structure between * northern and southern Vietnam. We observed the same in our survey sites as follows (see Tabel3-2-2):

- 1) The cultivated area and the total land area own per household was quite small in the Lac Dao and Dan Phuong communes in the north. Through land ownership reforms, in most cases of northern Vietnam farmlands were distributed to individual farms in proportion to the total number of family members, or adult family members. Then, the distribution of farmland per family is not as widely disparate as it is in the southern deltas (See Gini coefficient in Table 3-2-2).
- 2) Average cultivated area in Binh Phu commune is as large as found on common farms in the MKD. It is relatively larger than in the Long Thang commune, because it is in a newly reclaimed area.
- 3) The kinds of cultivated areas found in the MKD are various, namely, uplands, orchards, gardens, ponds, and dikes, but land resources other than paddy fields are scarce in the RRD. It seems that the diversity of farm activities and circulative resource use that we will describe later are partly attributed to these multifarious land resources.

Table3-2-2 Land Resources per Household(m²)

	Land Type								Ownership			
	Paddy	Upland	Orchard	Garden	Pond	Dike	Total	Gini1	Own	Rented in	Rented out	Gini2
Lac Dao	2,424	0	0	113	99	162	2,798	0.23	2,200	598	40	0.18
Dan Phuong	2,023	34	4	58	28		2,142	0.19	2,099	159	0	0.19
Binh Phu	8,210	35	264	1,555	243	22	10,329	0.32	10,254	265	190	0.33
Long Thang	12,736	20	179	1,570	333	430	15,267	0.26	15,192	115	39	0.27

Source: Survey data, 1995

Note: Gini 1 = Gini coefficient for total operating land

Gini2 = Gini coefficient for total holding land (own + rented out)

Mechanization

Mechanization of agriculture is not very developed in Vietnam, especially in the north. Little machinery was observed in Lac Dao and Dan Phuong commune. On the contrary, the Binh Phu and Long Thang commune are well equipped with pumps, sprayers and boats. Heavy machinery, such as tractors, harvesters and threshers, are not prevalent even in the MKD. Most cultivation is done by [custom work ??] in the south. Water buffalo is jointly used for cultivation in Lac Dao commune. Most farmers have livestock sheds and yards in the north, but not many farmers have them in the south.

A Diversified Farm Household Economy

The Vietnamese farm household economy largely depends on self-sufficiency in the all forms. While we would like to evaluate all form of self-sufficiency, it is quite difficult to evaluate the value of by-products used in crop production, such as fertilizer or compost, in animal production, such as feed, and in households, such as fuel. Therefore, we have only estimated the value of products consumed in households as a return in kind.

In the north, farmers depend heavily on self-sufficient production because they exist on very small farm resources, so that they fully utilize everything in their farming activities, and they also depend on off-farm income (Table3-2-3). In Dan Phuong, income resources were widely diversified as many of the farmers engaged off-farm jobs, such as carpentry, construction, etc.. On the contrary, for farmers in the southern delta, cash income from farming exceeds 70% and only around 20% of revenue is obtained from off-farm jobs. Non-farm job opportunities are relatively scarce in the south, so the farmers have to devote themselves even more to farming activities.

Using the Gini coefficient we see that the income disparity, the smallest total income difference is shown in Dan Phuong and largest is Lac Dao both in northern delta. The reason for this is believed to be that there is a wider range of return in kind is observed in Lac Dao. The farmers consume more farm products, especially vegetables, for home consumption in Lac Dao (Table 3-2-4).

It is interesting that the more diversified income generation, the less income distribution we see in the farm household economy in our survey sites.

Table3-2-3 Revenue from Whole Activities (per farm household, 1995)

Commune	North		South	
	Lac Dao	Dan Phuong	Binh Phu	Long Thang

	Cash Return	7,059,974	56.9%	4,057,770	41.7%	15,729,755	74.2%	11,950,328	71.2%
	Return in Kind	2,097,029	16.9%	2,579,474	26.5%	1,600,859	7.6%	1,395,316	8.3%
	Off-farm Income	2,969,300	24.0%	3,090,510	31.8%	3,865,480	18.2%	3,434,152	20.5%
	Total	12,397,572	100.0%	9,727,754	100.0%	21,196,093	100.0%	16,779,796	100.0%
US\$		1,127		884		1,927		1,525	
	Cash Return	0.3578		0.2972		0.3390		0.3478	
Gini Coefficient	Return in Kind	0.5742		0.2667		0.4333		0.5405	
	Off-farm Income	0.5112		0.5064		0.6695		0.5576	
	Total	0.3556		0.2368		0.3245		0.2991	

Source: Survey data, 1995.

Note: 1. Return mean gross income without deducted expense.

2. Off-farm income includes both off-farm income and non-farm income in this table.

3. 1 US\$ is equivalent 11,000 Vietnamese Dong (in1995).

Table3-2-4 Home Consumption

Amount	Rice (kg)	Vegetable (kg)	Fruit (kg)	Pig (kg)	Poultry (kg)	Duck (kg)	Fish (kg)	Wood (m3)	Others
Lac Dao	1,505	464	10	5	5	6	5	0	
Dan Phuong	1,634	196	0	3	12	0	0	0	
Binh Phu	837	26	179	2	16	9	48	8	
Long Thang	937	25	66	0	16	8	65	15	

Source: Survey data, 1995

Table3-2-5 shows the classification of annual per capita total income and its average in each surveyed site. The average income is highest in Binh Phu, followed by Long Thang, and lowest was seen in Dan Phuong, followed by Lac Dao. Only one family had an income level higher than 4 million- in Dan Phuong, in contrast to Binh Phu, where 41% of families had an income per capita of greater than 4 million-dong . In Long Thang, there were 15 families who were over 4 million-dong while 9 families were below 1 million-dong .

The income differentiation per capita among farm families was greater in Lac Dao and Long Thang. When we compare the distribution of per capita income to that of total family income, the former was more equalized than the latter. Anyhow, average per capita income level ranged from 177 to 344 USD, and this revealed that Vietnamese farm family incomes have stagnated around the poverty line even after received the benefits of Doi-Moi policies for 10 years.

Table3-2-5 Classification by Annual Total Income per Capita (Number of Households)

(dong)	Lac Dao	Dan Phuong	Binh Phu	Long Thang
<4,000,000	12	1	41	15
3,000,000-4,000,000	10	14	17	14
2,000,000-3,000,000	29	23	26	32

1,000,000-2,000,000	39	51	15	30
500,000-1,000,000	10	11	1	8
>500,000	0	0	0	1
Total	100	100	100	100
Average (dong)	2,476,938	1,944,596	3,783,811	2,723,633
Average (USD)	225	177	344	248
STDEV	1,623,025	810,943	2,079,427	1,681,344
GINI coefficient	0.3211	0.2319	0.2926	0.3108

Source: Survey data, 1995

Note: 1USD=11000dong

Rice Production and its Diversification

Field Conditions and Cropping Patterns

The diversification of the farm household economy is of great significance as to Vietnamese farmers as rice production stands at the crossroad. Vietnamese farmers in the MKD seem to be gradually losing their incentive to grow more rice when facing low prices in the world rice market and also in the RRD as they gain more income from non- or off- farm jobs. Let us investigate the situation of rice production in the farm household economy from the both the productive and economic points of view.

In the RRD, one hundred farmers in Lac Dao have 228,957 m² of paddy fields in 675 plots. With only 339 m² per plot, it looks like some kind of miniature landscape. They have twenty-one cropping patterns in these rice fields, among them, the most prevalent is winter-spring rice + summer-autumn rice followed by some kinds of winter crop. At the same time, vegetable production in the paddy fields is beginning to be introduced. In Dan Phuong, one hundred farmers use 225,420 m² of paddy fields, consisting of 697 plots. The prevailing cropping pattern is winter-spring rice + summer-autumn + winter soybean, and 64.7% of rice fields were covered by this pattern.

Table 3-2-6 Cultivated Fields

	Number of Farm	Number of Field	Total Area (m ²)	Area per Field (m ²)	Cropping Pattern
Lac Dao	100	675	228,957	339	21
Dan Phuong	100	697	225,420	323	18
Binh Phu	100	144	837,200	5,814	5
Long Thang	100	149	1,295,000	8,691	6

Source: Survey data, 1995.

By contrast, in Binh Phu, MKD, one hundred farmers had 837,200 m² of paddy fields with 144 plots in total. Each farm had 8,372 m² of paddy field and each plot was 5,814 m² in extent. Cropping patterns of rice fields were quite simple, with only five types of sequences, of which 94.3% were patterns of winter-spring rice

+spring-summer rice + summer-autumn rice. In Long Thang, one hundred farmers owned 1,295,000 m² of paddy fields with six cropping patterns in them, most of which were patterns of winter-spring rice +summer-autumn rice. Triple cropping of rice is not longer popular in this village.

The cropping pattern and also land utilization in the RRD were very complicated compared to those found in the MKD.

Rice productivity

However, rice productivity is higher in the MKD than it is in the RRD. Rice has recently been planted twice a year in the middle plain region of RRD. Yield of spring-summer paddy is relatively high in the survey site, but the summer-autumn paddies in Lac Dao were the lowest. In contrast, triple rice planting was adopted in two survey sites in the MKD, one where paddy yields were relatively high, in Binh Phu, and the other in Long Thang where it was not. As we mentioned before, Long Thang village is located in the newly reclaimed area, the soil condition is not very good even though the irrigation system has been prepared for triple cropping.

Table 3-2-8 Rice Productivity and Cash Income

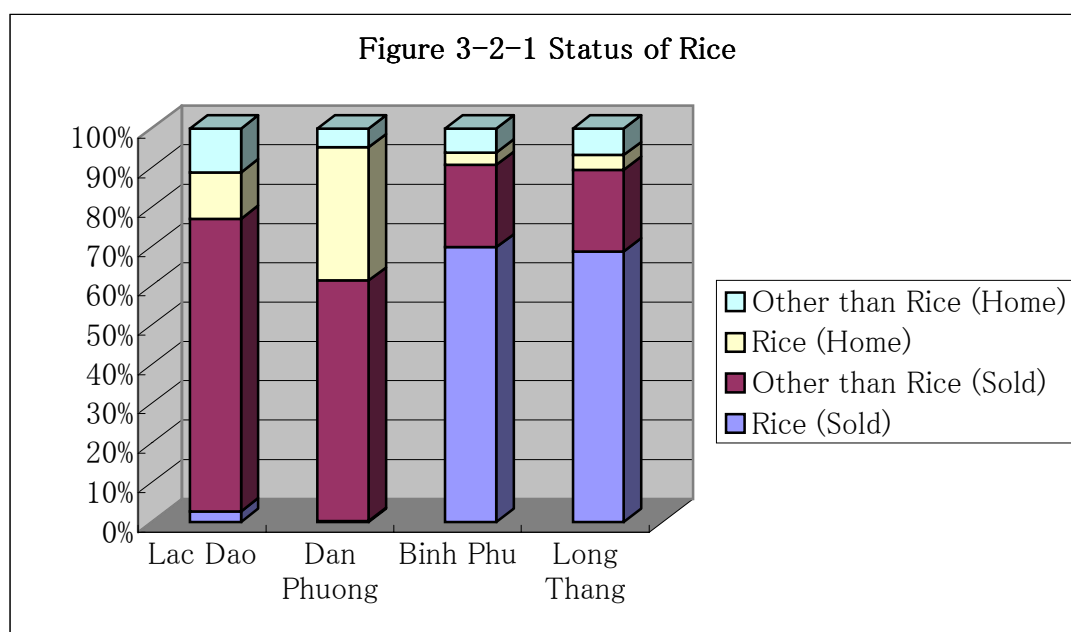
	Total Area (m ²)	Yield (kg/m ²)	Total Production (kg)	Sold in Cash		Value (dg)
				Qty (kg)	Price (d/kg)	
Winter-Spring Rice						
Lac Dao	0		0	0	0	0
Dan Phuong	0		0	0	0	0
Binh Phu	8,318	7.01	5,747	4,736	1,348	6,419,002
Long Thang	12,673	5.73	7,093	4,849	1,311	6,383,537
Spring-Summer Rice						
Lac Dao	2,056	4.49	987	104	1,389	135,636
Dan Phuong	1,994	5.36	1,071	3	1,800	5,400
Binh Phu	7,688	5.20	3,854	2,888	1,132	3,258,667
Long Thang	505	3.98	249	199	1,113	208,760
Summer-Autumn Rice						
Lac Dao	2,340	2.87	720	72	1,500	116,088
Dan Phuong	2,027	4.37	883	6	1,800	10,800
Binh Phu	7,352	4.77	3,544	2,031	1,202	2,423,070
Long Thang	12,587	3.62	4,445	2,518	998	2,585,639
Total Value (dg)						
Lac Dao						
Dan Phuong	16,200					
Binh Phu	12,100,739					
Long Thang	9,177,936					

Source: Survey data, 1995

Average total cash revenues from rice farming was over 12 million dong in Binh Phu, followed by 9 million dong in Long Thang, both in the MKD. Less rice was sold out, with a relatively higher price in the north. The lowest is Dan Phuong, only 16,200 dong and the next lowest, 251,000 dong is Lac Dao in the RRD.

On the contrary, more rice was used for domestic purposes, such as seed, home consumption and livestock feed, especially in the north (see Table3-2-4). The numerical value for domestic rice use in the north villages was twice or four times as much as it is in the southern villages.

The average value of home consumption evaluated by commercial prices in the RRD was higher than in the MKD (Table3-2-4). The high subsistence ratio of rice, which stems from the smallness of land holdings, accounts for low cash income and the high numerical value given to domestic income from rice in the RRD. On the contrary, the commercialized ratio of rice is higher in the MKD than it is in the RRD. As a result, farm household economy of the MKD is capitalized around 90%, compared to 60% for the RRD (see Figure 3-2-1).



Source: Survey data, 1995.

Use of By-Products

Since artificial resources are scarce the use of by-products is well organized within farming activities (see Table3-2-7). By-products of rice are used differently in the north and the south. In the north, rice straw is used for fuel and feed, but it is mostly burned on the field in the south. Rice husks are used as compost in the north, while it is used for fuel in the south. Rice bran is an important resource in raising livestock. Human feces, animal dung, leaves and roots are utilized in compost in the north. If rice production declined and the use of by-products were diminished, farmers would have to introduce artificial materials instead at great expense.

Table 3-2-7 Use of By-products (Estimated Amount)

Purpose	Straw		Husk		Bran		Feces		Dung		Leaves and Roots	
	Case	Kg	Case	kg	Case	kg	Case	kg	Case	kg	Case	Kg
Lac Dao												

Compost		97	170		98	378	98	3,390	73	152
Feed			2	100	98	144				
Fuel	23	1,085								
Other									1	60
Feed& Burn	73	1,480								
Fuel, Mulch and Feed	1	850								
Gift or Sale	2	1,050	1	30			2	325	1	1,500

Binh Phu

Purpose	Straw		Husk		Bran		Feces		Disposal		Leaves and Roots	
	Case	Kg	Case	kg	Case	kg	Case	kg	Case	kg	Case	Kg
Burn	70	6,746										
Compost	15	5,950							4	2,880		
Feed					69	316	28		5	730		
Fuel			79	500							16	
Mulch	13	7,554										
Other	1	800					1					
Gift or Sale	1	600	6	6,981	13	2,668						

Source: Survey data, 1995.

Other Farming Activities

Other farming sectors other than rice cultivation, such as livestock husbandry, fishing, growing fruit and vegetables were relatively vigorous in the MKD compared to the RRD (see Table 3-2-8). As we can see in the land resource allocation in Table 3-2-2, farmers were trying to utilize all kinds of land fully and combine them to produce various kinds of goods. These farm resources combination and utilization methodologies are studied as Farming Systems Research and Development in Vietnam (Nguyen Van Sanh, et al., Le Thanh Duong, et al 1998). Total cash income from other sections, however, was higher in the RRD. Our survey sites in the RRD are located within 25km of the outskirts of the capital Hanoi, so some of the farmers directly sold their farm products to the market (Sakurai 1999). Pig selling in both deltas generates more than half of other sector income.

Table 3-2-8 Other Cash Income From Farming (Value dong)

	Other Vegetable	Fruit	Livestock					Total Cash Income
			Pig	Poultry	Duck	Fish	Others	
Lac Dao	1,587,567	161,100	3,706,540	481,460	108,540	240,050	0	6,285,257
Dan Phuong	1,136,040	16,000	2,869,530	119,025	0	0	0	4,140,595
Binh Phu	68,120	977,260	2,026,571	223,155	164,350	140,060	29,500	3,629,016
Long Thang	361,245	304,630	1,555,578	81,830	101,380	162,430	205,300	2,772,393

Source: Survey data, 1995

Table 3-2-9 Vegetable Production

	Kinds of Crops in 1995	Amount (m ²)	Kinds of Crops in 1998	Amount (m ²)	Remarks in 1996	Remarks in 1998
1	Potato	720	Maize+ Potato	1,080	Quit cucumber. Fruit is more profitable. Increase chicken raising and pond. He has 4 orange trees, 10 grapefruits, 50 longans, 50 guavas, 30 lemons, 20 papayas and 50 sweet lemons	Quit oranges, grapefruits and sweet lemons. He thinks that mandarin is not suitable to this place. He raises 30 longans, 40 guavas, 30 pamelos, 70 mandarins and some litchis.
	Sweet Potato	720				
	Maize	360				
	Soybean	360				
	Cucumber	180				
	Vegetable	180				
	Total	2,520	Total	1,080		
2	Potato	1,053	Potato	607	Quit eggplant because of low price. Quit Chinese onion because it takes long days to grow, not efficient. Lack of funds to raise pigs. The price of vegetables is low.	He didn't grow onion and eggplant last year, but he will plant them again this year. Relatively stable for two years. Income improved but not very much.
	Sweet-potato	792	Sweet-potato	574		
	Onion	96	Tomato	360		
	Cucumber	360	Cucumber	1,415		
	Eggplant	288				
	Total	2,589	Total	2,656		
3	Potato	768	Potato	1,560	Quit eggplant and herb production. There is no place to sell herbs. The quality of the hybrid pig is good but the feed is expensive.	Stable mostly because of his pension (an ex serviceman)
	Soybean	288	Green-beans	720		
	Eggplant	168				
	Total	1,224	Total	2,280		
4	Soybean	1,080	Flower -cabbage	1,440	Suffered from fungi disease. Lack of manure.	Income increasing in general. He is suffering from a lack of labor. Potato production in this area is almost eliminated because of disease, low price and old variety. He raises longan and mandarin trees.
	Cucumber	648	Cucumber	1,440		
	Potato	648	Tomato	720		
	Eggplant	288	Eggplant	1,440		
	Total	2,664	Total	5,040		
5	Cucumber	840	Cucumber	837	Difficult to increase pig rearing because the pigpen is so small, impossible to expand.	Income increased in 1995-1998 so he built new house where his second son is living.
	Potato	336				
	Maize	744	Maize	406		
	Soybean	1,356	Soybean	2,734		
	Total	3,276	Total	3,977		
6	Cucumber	720	Cucumber	1,080	No plan to expand pig-rearing, lack of labor for their care.	Rents land from his brother-in-law who moved to HCMC. The situation became better in general but not very much.
	Soybean	2,532	Soybean	2,532		
			Maize	576		
	Total	3,252	Total	4,188		
7	Cucumber	720	Cucumber	1,392	Pig prices are low.	Living standard is improved. He purchased furniture and other equipment.
	Potato	672				
	Soybean	240	Soybean	1,632		
	Maize	480	Maize	480		
	Total	2,112	Total	3,504		
8	Cucumber (w)	384	Cucumber (w)	360	Lack of feed to raise more pigs.	The number of his family members has decreased, so the land he owned also decreased. Price of products is increasing so the income
	Cucumber(s)	672	Cucumber(s)	336		
	Potato	1,056				
	Soybean(s)	1,392	Soybean(s)	384		
	Soybean (w)	1,632	Soybean (w)	1,032		

Maize	744	Maize	768
Total	5,880	Total	2,880

is increasing.

Source: Survey data, 1995,1996,1998

Table 3-2-10 Livestock Raising

Kinds of Livestock in 1995	Amount (heads)	Kinds of Livestock in 1998	Amount (heads)	Remarks
1 Breeding pig Piglet Chicken Fish	2 2 30	2 Breeding pig 2 Piglet Chicken	4 8 40	
2 Breeding pig Piglet Chicken Duck Buffalo	2 7 50 20 1/5	2 Breeding pig Chicken Duck	15 30	Dead
3 Breeding pig Chicken Duck	2 15 35	2 Breeding pig Piglet Chicken Pigeon	1 2 35 3	Dead Dead
4 Breeding pig Piglet Chicken Duck Rabbit Pigeon Fish	4 14 70 4 6 8	4 Breeding pig Chicken Duck Rabbit Pigeon Fish	? 14-20hens 0 2	
5 Fattening pig	2	2 Fattening pig	8	
6 Fattening pig	4	4 Fattening pig Fighting Cock	6 5	
7 Fattening pig Chicken Pigeon	4 20 14	4 Breeding pig Piglet Chicken Pigeon	2 40 0 4	Dead
8 Fattening Water Buffalo Chicken	2 1 3	2 Fattening Water Buffalo Chicken	2 1 3	

Source: Survey data, 1995,1996,1998

Recent Changes in the Red River Delta Survey Sites

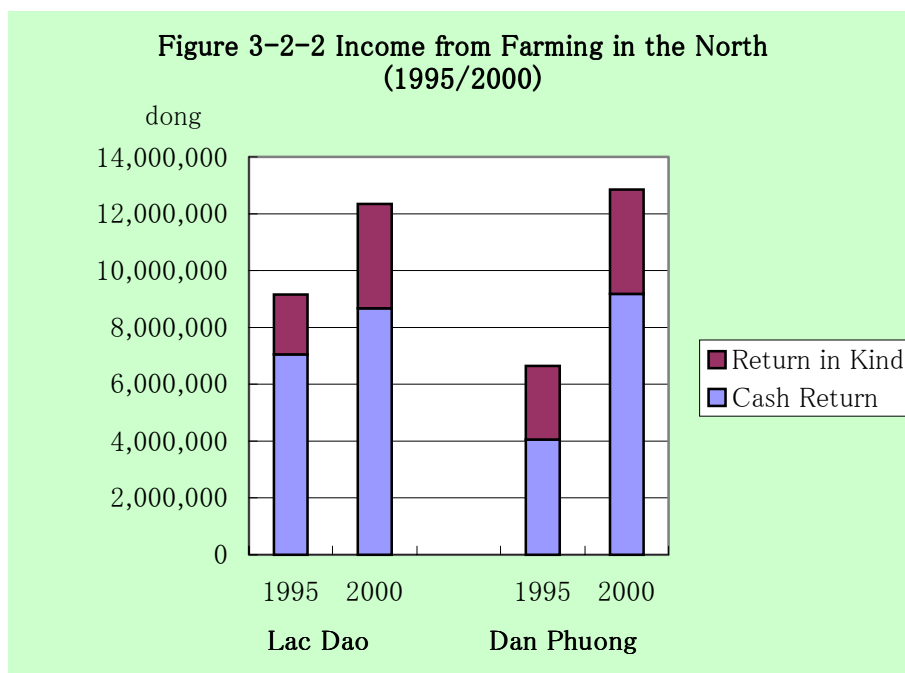
We selected 8 households to investigate the recent changes in cropping patterns, animal husbandry, sale and price of products in the RRD. We revisited the same households in 1995, 1996 and 1998 (4 farms in Lac Dao and 4 farms in Dan Phuong). The changes we observed are as follows:

In most cases, farmers expanded vegetable production. In one exceptional case, the farmer has been changing his farming activities from vegetable farming to fruit farming. In another case reduced family members caused a decrease in cultivated area.

However, vegetable production is not as stable in Lac Dao as it is in Dan Phuong. For instance, the farmers in Lac Dao had quickly changed what vegetable they were raising and where they were planted. Some of them quit raising the eggplant, potato and Chinese onions that the area is famous for and some began raising tomato and flower-cabbage. In Dan Phuong, the number of vegetables raised was limited. Because of low prices, old varieties and damage caused by disease, the farmers stopped potato production there.

One of the reasons why the farmers in Lac Dao changed what vegetable they raised was the lack of stability in prices. It wasn't that prices were continuously low; rather they fluctuated not only season-by-season and place-by-place, but also day-by-day.

The big difference between these two places is the role of the cooperative. The leaders of the cooperative in Dan Phuong were able to sell their products, but the leaders in Lac Dao could not coordinate a marketing channel for their vegetables. So the farmers in Dan Phuong are still producing cucumber and soybean.



Source: Survey data, 1995, 2000

We revisited two of our survey villages in the north, Lac Dao and Dan Phuong in 2000. Although we have not processed the data fully, the primary sum for farming income is shown in Figure 3-2-2. The total average income from farming activities in Lac Dao was higher than in Dan Phuong in 1995, but it was almost the same in 2000. That means that income generation in Dan Phuong is rising faster than it is in Lac Dao.

Another serious fact to consider is the lack of agricultural technologies, which caused lots of difficulties. For instance, one farmer planted orange, grapefruit and sweet lemon trees in 1996, but he abandoned them before the trees matured due to a lack in technical knowledge. In the case of two other farmers, breeding pigs they reared died of lung disease due to a lack of medicine and knowledge. As we mentioned previously, in Dan Phuong, farmers abandoned potatoes due to a lack of new varieties and because of problems with disease.

In respect to social economic conditions, the absence of a marketing system has led to instability in vegetable production. Although the farmers have many marketing channels, such as direct sales to the local market, to local merchants, to cooperatives and direct sales to the city, none of these were stable. Authorized information on the price and the amount of agricultural commodities does not exist.

Conclusion

To evaluate the diversification of Vietnamese agriculture from the standpoint of historical and economic development, there are both similarities and dissimilarities between Vietnam and other Asian countries. In the case of Vietnam, the diversification of agriculture had led to an improvement in food consumption, along with economic development to some extent. The expansion of vegetable production and animal husbandry is also in evidence.

While the overproduction problem that resulted from the achievement of national food sufficiency induced other Asian countries to diversify their agriculture, it seems that it is only now that Vietnam is beginning to face this serious problem. Rather one could say that rice production was encouraged, especially in the central and northern Vietnam, to supplement regional insufficiencies in rice and in the south to provide the Vietnamese government with a supply of export rice to acquire foreign currency.

Nonetheless, why has diversification been such a keen problem for Vietnamese agriculture? We can point out at least four reasons. First, after the abolishment of collective farm policy and the privatization of land tenure, Vietnamese farmers became relatively free to move so, in order to prevent the inflow from rural areas into urban areas, the diversification of farming activities and household economy was required in order to increase and expand the opportunities for income generation in rural areas.

Second, as we stated earlier, intensive rice cultivation that included the application of chemical fertilizers and pesticides spread, especially in the MKD. The overuse of these materials began to threaten rural environments with the implementation of double and triple rice cropping. Furthermore, rice monoculture caused soil deterioration in some areas. This led to the desirability of a diversification of rice farming to create a sustainable cultivation of agricultural land.

Third, as we observed in Figure 3-2-1, around 70% of farm income derived from

rice cultivation in MKD. Since there were frequent fluctuations in the world market for rice, which was sometimes lower than the domestic market, the farm household economy was affected and became destabilized. Farmers were then willing to introduce crops other than rice into their rice fields.

Fourth, in contrast, rice is a subsistence crop in the RRD because of the smallness of farmland. As income from crops other than rice has been an important means for acquiring a cash income, diversification of farming became one of the main countermeasures used to commercialize individual farms under the market-oriented economic policy.

As shown above, market systems are desirable to support farmer's efforts to diversify farming activities, however, market channels are not well established and farmers are not organized in marketing. If agricultural cooperatives existed for the purpose of marketing, as they do in Japan, or the marketing channels and systems were well organized, they would be quite helpful in building specialized farm product areas in Vietnam.

To what extent or under what kinds of condition farmers are able to diversify their household economy and farming activities, we should investigate how the soil condition, irrigation, drainage and topography are concerned to the diversification. In our survey sites, irrigation systems are in relatively good condition, except for the Long Thanh village in MKD, but even if it were in good condition, suitable areas for vegetable production are quite limited because of poor drainage systems. Consequently, farmers who want to grow vegetable have to build soil mounds in their rice fields in order to prevent water damage to their vegetable. Otherwise farmers have to convert paddy fields into upland fields for vegetable production.

Finally, to evaluate the current situation with regard to agriculture diversification, animal husbandry, fruit production, aquaculture, etc., that were introduced in the household economy, and the new cropping patterns of the paddy fields that were [? simplified] to rice in the MKD, it appears that horticulture that is utilizing pond, garden and orchards around farmhouse and the cultivation on paddy field were [? distinguished separately], and then interaction between the garden and the fields were not very effective. The utilization of paddy fields in the MKD should be diversified.

On the contrary, the utilization of paddy fields was diversified and the cropping patterns have become very complicated in the RRD, with rice production being combined with vegetables, beans and forage crops. While rice may be seen as a subsistence crop, it is likely that rice production will be abandoned where the intensified commercial crops are introduced. The development of rice productivity and quality improvements, sustainable cropping patterns with soybean or forage crops will be required in the RRD.

As Dr. Yujiro Hayami stated, "Agricultural diversification, defined as diversification of agricultural production, marketing and processing activities, in the major cereal sector can contribute significantly to both growth and equity in developing countries. However, it must be pointed out that diversification into new

crops and livestock products is not likely to be successful unless it is based on major technological advancements in either farm production or processing/marketing.” (Hayami, 1991) This must surely also be applicable in both the southern and northern deltas of Vietnam.

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