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Rice Production and Processing in Northern Vietnam –A result of field survey in Yen My Town, Hung Yen province–

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Agriculture in Vietnam is now in the course of restructuring (Izumida, *et al.*, 2000), and marketing system of farm household products is gradually and steadily transforming (Kawaguchi, 2003). We are interested in making clear the historical process of transformation of marketing system of farm household products in Vietnam both empirically and theoretically. But we have not enough basic data in hand for such study. In this paper we try to make some basic data for marketing system of rice in Vietnam. Seventy households consisting of 30 rice-growing households, 5 collecting households, and 35 milling and processing households were surveyed by interview method in Yen My Town– Hung Yen Province, a big rice trading and processing centre in the North.

Collecting households operate in quite big regions that cover many provinces of Red River Delta, of central coast and of Mekong Delta. Each household buys in average per year a volume of 770.5 tons of paddy and 906.5 tons of milled rice. Their main obstacles are poor storing condition, lack of funds, and lack of market information. The average rice processing capacity of milling and processing household is 3366.67 tons, 1666.75 tons, and 1139 tons per year for large, medium, and small-scale plants respectively. Lacks of available credits, low rice price, restriction of capacity of power line, narrow surface area used for processing are also contributing to the difficulties in rice processing.

1 Introduction

Red River Delta is the second largest rice producing basin of Vietnam. It covers 9 provinces and cities with the total area of 1266.3 thousand hectares. It was created by alluvial soil of the Red River (Song Hong), Thai binh River (Song Thai Binh), and Duong River (Song Duong). Because of high population density, the average area per capita is only 591 m², the lowest of the nation (GSO 2000).

Due to small rice growing area per capita, high population, labor surplus with high unemployment rate, and undeveloped rural markets, the living standard of rural farmers is low and in difficulty. Therefore, the development of rural traditional industries and trade is necessary to create jobs and improve the living standard for farmers.

Yen My town has a long history of rice trading and rice milling and processing. Recently, the living standard of Yen My people has been gradually improved. With the

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help of transportation business, rice trading and milling and processing has become a good source of income for local farmers. Therefore, Yen My district was selected as a case study site for our research. General objective of study is to make basic data for trading, processing, and marketing of rice in the North of Vietnam. The result of study could be good reference in providing useful data and information to understand the rice farming and marketing system of Vietnam. Moreover, it can be clear evidence of the large inter-regional marketing networks, especially between Mekong Delta and other regions in the North.

The main method to collect information for this research was direct interview through a set of questionnaires. In order to get the accurate information and more data, consultation with local government officials also was implemented. The questionnaires focused mainly on the current production situations of household such as general information about household and household head, education level, experience in production and business, labor use, income and source of income of household, asset and financial capital status to support rice production and processing. Then the current situation of rice production and processing, the product marketing system, activities of supporting organization such as agricultural cooperatives, rural credit system, agriculture extension system, and finally, problems, difficulties that affect rice production, trading and processing at the local are also be exploited.

Table 1. Number of surveyed households in Yen My town (unit: household)

Type of HH \ Hamlet	Total	Trai trang	Do Xa	Ong To	Dong La	Nghia trang
1. Rice growing HH	30	6	6	6	6	6
2. Rice collecting HH	5	1	1	1	1	1
3. Rice milling HH	35	12	5	8	5	5
Total	70	17	10	13	10	10

Through observations, the households participating to the rice production, trading and processing were classified to the rice-growing household, rice collecting household, and rice milling and processing household. The total number of households studied was 70, of which there were 30 rice-growing households, 5 rice-collecting households, and 35 rice milling/processing households. Table 1 shows the breakdowns of types of those farming households in Yen My.

Those 30 rice-growing households were categorized into three groups as high-income, medium-income, and low-income households. The classification was based on the information of the Ministry of Labor, Invalid and Social Affair. Besides, classification was also based on local criteria of Hung Yen province and Yen My town. In the sample, the number of household in each group were selected proportionally to real proportion of high, medium, and low income households in Yen My town in order to ensure truly representative sample of population as a whole.

Rice milling and processing households were categorized by size. In this case, the category was defined only relatively. Households with large-scale plants were those that had modern machinery and some had facilities from cleaning, drying, sizing and polishing.

Large mills have capacities of over 10 tons/day. They also participated in rice collecting activities. Households with medium scale plants had small rice milling and processing equipments. Medium mills process about 4–10 ton/day. For those with small-scale plants, they had only small rice milling machines. Small mills handle less than 4 ton/day. Typically, these mills remove the husk and part of the bran, but do not have facilities as larger mill plant, and mostly to serve farmers in the local area.

2 General background of Yen My

Yen My town is located in the south of My Van district, Hung Yen province. It is about 4 kilometers from the district center, with an area of 407.91 hectares. Yen My can be viewed as main access point for transportation connected to National Route 5A to the center of Hung Yen province. It has 2 kilometers of provincial route 39A crossing the district center. The transportation networks connecting the district with other districts in the area, and other vicinity provinces such as Thai Binh, Ha Noi, Hai Duong, and Bac Ninh are well developed. With such location, Yen My town has been seen as splendid place for the rice collecting and rice processing activities.

The paddy area for rice production of the district is 260 hectares; the area is in the decreasing trend in recent years. The average paddy area per capita is 258.7 m². Land used for rice production occupies 96.7% of the total agriculture land, which is in decreasing trend due to rapidly urbanization, housing needs, and other new construction works (communal statistical office, 2002).

Yen My town consists of 5 villages: Trai Trang, Do Xa, Ong To, Dong La, and Nghia Trang with almost 3,000 households (table 1). Of that, farming households occupy 89.3%, industrial and small industrial households 9.1%, and servicing households 1.6%. Since after renovation many non-farm activities have been developed in Yen My, such as transportation service, food processing, small rural industries. Those activities have created employment and increased income for households here. Ratio of high-income households is 30%, medium-income 65%, and low-income 5%. Recent year the number of pure farming household has trend to decrease. Total labor force was reached to 7,300 persons in Yen My in 2001. Farming labor force occupied 81%, small industrial labor force 15.7%, and service labor force 3.3%. The number of persons joining labor force still has trend of increase by year, however, the ratio of agricultural labor force has been decreasing (Communal statistical office, 2002).

3 Socio-economic situation of rice based farming system in Yen My

Of the 30 rice-growing households, we selected 9 in high-income group, 15 in medium-income group, and 6 in low-income group. Of the 35 rice-milling households, we chose 9, 15 and 11 large-scale, medium-scale and small-scale plant, respectively.

3.1 Rice-growing households

Some characteristics of the household head including the age, gender, education level, years of experience and household income are presented in table 2. As seen in the table 2 the age of the head of household ranged from 40.2 to 46.4 with average of 42.8 years. Even both man and woman worked together in farming activities, but the man plays the main role in making decision in the family. The ratio of male as household head is accounting for 87.42%, while this figure for women only 12.58%.

Table 2. General information of rice- growing household

Indicator	Unit	High income HH	Medium income HH	Low income HH	Average
1. Age of HH head	Year	46.4	41.5	40.2	42.8
2. Gender of HH head					
– Male	%	89.34	82.13	90.75	87.42
– Female	%	11.66	18.87	9.25	12.58
3. Education attainment of HHH					
– Primary school	%	32.16	39.48	48.09	39.55
– Secondary school	%	57.63	55.73	51.91	54.28
– High school	%	10.21	5.79	–	6.17
– University	%	–	–	–	–
4. Farming experience of HHH	year	25.19	21.08	19.73	22.56
5. Income structure of HH	1000VND/year	15564.29	8947.35	5839.47	10310.90
– Crop production	%	10.56	20.82	35.53	20.68
– Livestock production	%	20.05	25.04	25.68	23.67
– Others	%	69.39	54.14	38.79	55.65
Number of survey household	HH	9	15	6	30

Source: Survey 2002 Note: HHH: household head HH: household

In general the literacy rate among farmers was low. Mostly household head attained only education level of primary and secondary school, the proportion of farmers attaining higher school and higher education were very small. This figure was found lowest in the low- income group. The low level of education was one of constraints that discourage farmers from adopting modern technologies and new agricultural knowledge.

The source of income of farming household was from agriculture accounting for 44.35%, of which 20.68% from crop production and 23.67% from livestock production in average. However the structure of income source varied by groups. Only 30.56% of total income of households of high-income group earned from agriculture, but this figure of low-income group was 61.26%. The rest of 55.65% of income was from other sources such as food processing, transportation, trade, hired labor.

The situation of land, family size and labor forces are presented in table 3. The

Table 3. Information on land, family size and labor force of rice growing household

Indicator	Unit	High income HH	Medium income HH	Low income HH	Average
I. Land holding	m ²	1177.5	1070.37	1063.73	1092.69
1. Rice land	m ²	1082.50	1015.81	1002.94	1020.52
2. Garden land	m ²	42.2	33.4	30.1	35.38
3. Pond	m ²	20.1	–	–	6.03
4. Other land	m ²	32.70	28.16	30.69	30.76
II. Member and labor					
1. Family size	person	4.81	4.64	4.57	4.69
2. Number of labor	Person	2.66	2.73	2.54	2.67

Source: Survey 2002

average area of rice production for each household is 1092.69 m². The difference in land holdings of those three groups of household is unnoticeable since the land area used for rice-growing activities is assigned according to the number of member in each household. At Yen My district, the family size is slightly different among groups. It ranged from 4.57 to 4.81 persons with average of 4.69. High population and small area are also conditions contributing to development of non-farm and service activities such as rice milling and other food processing.

Some main assets for farming of rice growing households are reported in the table 4. Assets of households for farming were rather poor. Most of farmers own only water pump and pesticide sprayer as some tools for farming. At Yen My district, Majority of households uses machines rented from the Agricultural Cooperatives or other households for land preparation and threshing. Therefore, buffaloes, cows, and manual rice threshing machines have no longer been used.

Table 4. Farming asset of rice growing household (unit: 1000VND)

Asset	High income HH	Medium income HH	Low income HH	Average
1. Construction works				
– House	60,000	42,500	18,250	41,154
– Yard	4000	2950	1215	2918
– Animal stable	4250	3034	2129	3215.8
– Other works	10833	7500	3667	7458
2. Water pump	291.67	256.25	234.19	255.14
3. Pesticide sprayer	50.83	49.02	44.50	48.17
4. Threshing machine	1000	–	–	300
4. Bicycle	337.5	247.50	262.31	268.24
5. Other transportation means–		–	–	–
6. Cash	9562	6168	3605	6673.75

Source: survey 2002

3.2 Rice collectors

The total number of collectors (collecting household) is five. Since the number is small, so we did not categorize them into groups. Information about age, gender, education level, years of experience of heads of households, and income structures are presented in table 5.

The average age of heads of households is 39.82 years. The proportion of head of household being male is 88.17% and female 11.83%. Head of collecting household attain higher education level compared to rice growing households. The proportion of those who graduated high school is 62.21%, and those who only graduated primary school is 7.38%. Most of farmers have started expanding their business during 1990–1995 with 8.64 year of experience. However, some of them had experienced as very small collectors at local area, so called “hang xao” in Vietnamese language for long time. The main sources of income are from collecting activity and other non-farm activities accounting for 71.35%.

The average number of household members in each household is 4.41 persons with

Table 5. General information of collecting household and milling and processing household

Indicator	Unit	Collecting HH	Milling and processing HH			
			Large scale	Medium scale	Small scale	Average
1. Age of HH head	Year	39.82	42.17	44.09	41.86	42.59
2. Gender of HHH						
– Male	%	88.17	86.26	80.98	78.61	82.73
– Female	%	11.83	13.74	19.02	21.39	17.27
3. Education attainment of HHH						
– Primary school	%	7.38	0	13.33	18.18	11.43
– Secondary school	%	30.41	44.44	53.33	63.64	54.29
– High school	%	62.21	55.56	33.33	18.18	34.28
– University	%	–	–	–	–	–
4. Experience	Year	8.64	13.08	11.72	9.65	11.57
5. Income of HH	1000d/year	25583.74	55545.54	35412.65	28283.54	38349.1
– Crop production	%	18.09	4.94	6.07	9.92	6.87
– Livestock production	%	10.56	17.16	19.51	25.68	21.35
– Other	%	71.35	74.12	70.83	61.41	69.66
			3.78	3.59	2.99	3.47
Number of survey HH	HH	5	9	15	11	35

Source: Survey 2002 Note: HHH: household head HH: household

the average number of labor force is 1.79 persons. Due to requirement of many labors in the collecting activities, therefore, collectors usually have to hire labor with 2.13 labors as permanent labor and 2.86 labors as temporary labor during peak time. The data of family size and labor was presented in table 6.

The capital resources and equipments are listed in the following table 7. For collectors, drying yard and warehouse are very important. Since the warehouses of those household is small and limited space therefore, many of them use part of their houses as warehouses for rice. But for those big collectors, they have their own warehouses. According to table 7, the average value of warehouse is 21,576,000 VND. Besides, they also own transportation means mainly trucks, tractors, and bicycles. Small trucks and car are used for long distance, transportation and collecting activities in distance. For

Table 6. Family size and labor force of collecting household and milling and processing household

Indicator	Unit	Collecting HH	Milling and processing HH			
			Large scale	Medium scale	Small scale	Average
1. Family size	Person	4.41	5.66	5.34	5.09	5.28
2. Family labor force	Person	1.79	2.32	2.81	3.06	2.83
3. Hiring labor						
– Permanent	Person	2.13	2.95	2.17	1.98	2.37
– Temporary	Person	2.86	3.76	2.24	1.77	2.91

Source: survey 2002

Table 7. Production asset of collecting household and milling and processing household
(unit: 1000VND)

Asset	Collecting HH	Milling and processing HH			
		Large-scale	Medium scale	Small scale	Average
1. Construction works					
– House	61,154	87104	79,365	45,471	75,138
– Back yard	6,547	5206	4311	3,079	4019
– Animal stable	9,721	12795	10,508	7,188	10,124
– Other works	17,836	–	–	–	–
2. Rice storehouse	21,576	26417	20,116	13,790	19,884
3. Truck and car	150,911	152,128	–	–	–
4. Bicycle	325	421.3	389.6	310.07	391.06
5. Other means	12,089	17,608	13,191	–	16,085
6 Milling machine		22149	14741.37	12045.63	16954.36
7 Polishing machine		62,500	–	–	–
8. Capital in cash	68,314	80,540	60,250	30,380	56,174

Source: Survey 2002

collecting activities in local area, the main transportation mean is bicycle. Yen My district has a quite modern network of transportation. Therefore, it is great advantageous for collectors to rent transportation means. Compared with that of the rice-growing households, collectors usually have much bigger average of capital investments and resources.

3.3 Rice Milling and Processing households

Heads of those households are mostly male as the same as rice growing and collecting households with the proportion of 82.73%. The highest level of attained education of household head is high school. The large-scale milling and processing plants have the highest ratio of high school attendance, 55.56%, and the lowest high school attendance rate of 18.18% is found at the small-scale milling and processing households. The average years of experience are also highest for those households with large-scale rice milling and processing plants. Table 5 shows that the main source of income of those households from rice milling with the proportion of 69.66%. The income from agriculture especially from crop production just made up a small proportion of 28.22%. However, income from livestock production of those households is relatively high accounting for 21.35% in average since these household can use some by-product such as bran, husk of processing activities for poultry and pig breeding. This shows the good combination between rice processing and development of animal breeding. Households with large-scale plants obtained highest income compared with those of small and medium-scale households.

Table 6 shows the current situation of household member and labor force. The average size of household is 5.28 persons. Households with small scale have the highest numbers of family labor force with 3.06 persons. In many cases, many family labors involving in off-farm are working in the city. Therefore, those households have to hire labor, and it is found that the ones with bigger plants will have to hire more labor. The

average number of permanent hired labor force is 2.37 persons at normal seasons and 2.91 at peak seasons. They get paid either daily or monthly. Wage rate of hired labor is around 15,000–20,000 VND/day depending on the type of work.

Of all of them, the most valuable asset is the house, and it also often used as warehouse. The main transportation means are small trucks and bicycle. Of 35 households that we interviewed, there are only five households, which also participate in collecting activities besides the milling activities. They are always households with large-scale of plants. The rest of them (30 households) mainly provide only the rice milling services. They are usually households with medium and small-scale plants. Main equipments used are rice husking, milling, and polishing machines. The average value of a milling machine is 16,954.360 VND. Each household can equip themselves with husking and milling machines, but polishing machine since it is very expensive. For those households equipped with rice polishing machine, they are usually the rich households with large-scale plants, and their products are always prepared for export. All information is presented in the table 7

4 Current situation of rice production and processing

4.1 Rice Production

The total area for annual crop of Yen My are 236.88 hectares, and it is mainly devoted for rice. There are two main rice seasons that are spring rice season (Vu Xuan) and summer rice season (Vu Mua). Besides, farmers also grow various crops such as vegetables, beans, potatoes, soybean, and corns. The soil is used efficiently, with coefficient of land use intensity of 2.3 per year. With the current soil and weather, the main rice varieties used are Chinese hybrid such as Q₄, Q₅, Khang Dan, and glutinous rice TK90. The main reason for using such rice varieties is high and stable yield for Chinese hybrid varieties and high selling price for glutinous and high quality ones.

For both Vu Xuan and Vu Mua season, high-income households devoted main area for glutinous rice TK90 with about 41.09% and 41.96% of their growing area while these figures in medium and low-income households only 36.46%, 39.75% in Vu Xuan and 25.53% and 20.69% in Vu Mua, respectively (table 8).

Besides the survey on types of variety, we also surveyed and calculated average rice yield regarding to different varieties in two seasons in year 2001 as presented in table 9. Table 9 shows that the average yield of rice (paddy) of high income household is found highest compared to two other groups, however, the difference is not very much significant in yield among those types of households. The Q₅ variety has the highest yield for

Table 8. Share of rice growing area by rice variety (unit: %)

	Spring crop				Summer crop			
	Q ₄	Q ₅	TK90	Others	Q ₄	Q ₅	TK90	Others
1. High income	20.14	31.92	41.09	6.85	24.02	26.99	41.96	7.03
2. Medium income	25.05	38.49	36.46	–	27.19	40.41	25.53	6.87
3. Low income	12.24	48.01	39.75	–	35.87	43.44	20.69	–

Source: survey 2002

Table 9. Average yield of paddy (Unit: kg/ha)

Type of HH	Spring crop			Summer crop		
	Q ₄	Q ₅	TK90	Q ₄	Q ₅	TK90
1. High income	5003.1	5135	4970.7	4897.8	5027.4	4857.3
2. Medium income	4997.7	5113.8	4954.5	4892.4	5016.6	5854.6
3. Low income	4989.6	5084.1	4946.4	4876.2	4951.8	4838.4
Average	4997.8	5116.5	4957.2	4892.4	5011.2	4843.8

Source: survey 2002

Table 10. Cost of paddy cultivation in VND per hectare (unit: 1000 VND/ha)

Cost item	Spring crop				Summer crop			
	High income	Medium income	Low income	Average	High income	Medium income	Low income	Average
Family labor	810	3131	4320	2673	810	3132	4200	2649
Hired labor	3740	1512.5	337.5	1948.75	3625	1500	337.5	1905
Material	2029	2108.9	2103.3	2083.81	1959	2047.5	2032.5	2017.95
Rent machine	931.5	1175.5	1174.5	1001.6	913.5	1174.5	1175.5	1096.2
Others	810	810	810	810	810	810	810	810
Total	8330.5	8737.9	8745.3	8617.16	8117.5	8664	8554.5	8478.15

Source: survey 2002

both Vu Xuan and Vu Mua. In general, rice yields of every variety are higher for Vu Xuan than Vu Mua. Non-sticky rice has attained higher yield than glutinous rice. However, some households still grow glutinous rice with 90 to 100% of their sowing area since it can be sold with higher price than that of non-sticky rice.

As shown in table 10, the average cost to grow rice per hectare is 8617.16 thousand VND and 8478.15 thousand VND for “Vu Xuan” and “Vu Mua” respectively. In “Vu Mua”, most farmers do not use potash therefore the total cost is slightly less than that of “Vu Xuan”. However, we notice that there is almost similar in the investments of households for the rice production. Taking the expenditure of spring rice as an example, the total cost for one hectare of paddy is 8330.5 thousand VND, 8737.9 thousand VND and 8745.3 thousand VND for high, medium and low-income group, respectively. However, the cost structure between main cost items like family labor, hired labor, material, rent machine and other costs varied by groups. Regarding to labor cost, high-income group used hired labor than family labor while the low-income group use mainly their family labor. For high-income household some activities such as rice transplanting, caring, harvesting, threshing, and transportation are all done by hired labor.

At Yen My town, the labor wage rate for rice transplanting and harvesting is attractive ranging from 20,000 dong to 25,000 dong/man-day. Comparing with that of other areas in the Red River Delta it is about 5000 dong/man-day higher. Then when calculating the family labor expenditure we used the local wage rate, and it made the total cost much higher. The expense for land preparation, tax, and irrigation fee are almost the same for

all households since the cultivated area of households are not much different and those fees are calculated based on a local measurement "sao" (1 sao=360 m²). One hundred percent of households except of some in high-income group use tractors for land preparation provided by agricultural cooperatives. The charge of preparing the land is 25,000 dong/sao or 675,000 dong/hectare. The cost of rice seeds is ranging from 3,500 dong to 4,000 dong/kg, and that of glutinous rice seeds is ranging from 4,800 dong to 5,000 dong/kg. Almost households use threshing service and do threshing at the rice field soon after harvesting, then after that they just carry paddy back to their house.

Information on the cost of production and return of rice per one hectare was calculated, shown in table 11. The gross return varies by season and group of farmer. It obtains the higher value on spring season than those in summer season. Due to better yield earned and higher selling received therefore, high income household attains higher net return.

Table 11. Production cost and return of rice per 1 hectare (Unit: 1000VND)

Cost item	Spring crop				Summer crop			
	High income	Medium income	Low income	Average	High income	Medium income	Low income	Average
Total cost	8330.5	8737.9	8745.3	8617.16	8117.5	8664	8554.5	8478.15
Revenue	10470.8	9852.26	9546.93	9976.76	9552.25	8938.26	8804.7	9095.75
Net return	2140.3	1114.36	801.63	1359.59	1434.75	274.26	250.2	617.6
Return (including family labor)	2950.3	4246.36	5121.63	4032.59	2244.75	3406.26	4450.2	3266.59
Cost per unit (d/kg)	1591.19	1685.09	1694.66	1658.61	1614.62	1744.77	1748.85	1706.07
Cost per unit (excluding family labor)	1436.67	1081.09	857.53	1144.12	1453.51	1114.04	890.22	1173.01

Source: survey 2002

After harvesting, households keep only a small amount of rice for their usage; the rest is sold within one or two months. Sometimes they themselves transport rice to the market to sell, but usually collectors and rice millers (or processors) come and buy all (Figure 1). The selling process is based on the agreement between the sellers and the buyers. According to respondents of 30 rice-growing households when asked that what the main factor in pricing are, 100% answered that the price of rice is based on two main factors, the market prevailing price and the quality of rice.

Agricultural Cooperatives of the district provides for its members with three services: seeds, fertilizers, and irrigation. Of the 30 households interviewed, 21 of them (70%) say the Agricultural Cooperative providing good services, while 9 of them (30%) say the service still needs to be improved. Irrigation is considered very important and requires large investment in constructing irrigation system, so that individual household cannot service on its own. Most of households are satisfied with the service of irrigation and supplying seeds. Other commercial services of the Agricultural Cooperatives are facing hardship and tough competition with those services of private sectors.

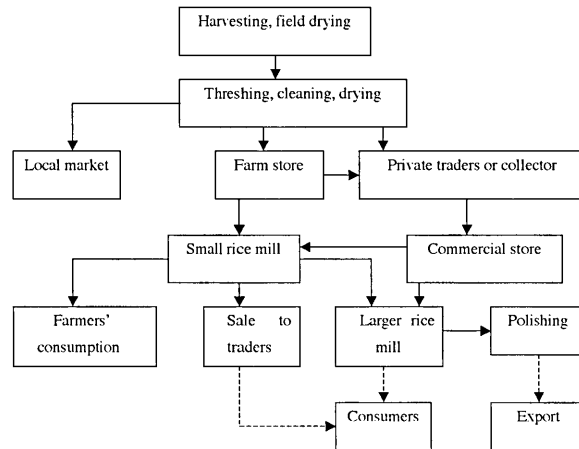
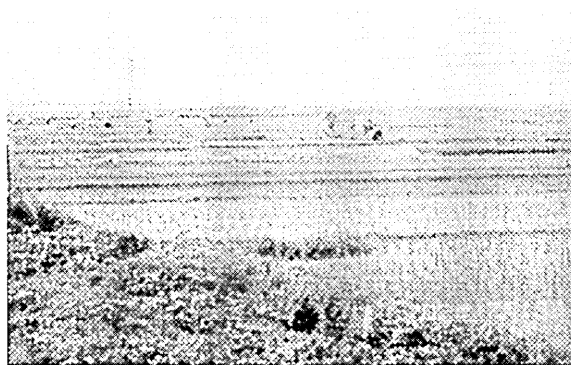


Fig. 1. Post harvest system of paddy/rice

Of the 30 rice-growing households interviewed, there are 17 households or 56.57% reported to use credit loan. Of those households, 9 or 52.94% borrow money from the Agriculture Bank, 6 or 35.29% borrow from farmer association, and 2 or 11.77% borrow from Bank for the poor. The average borrowing quantities are 10.52 mil VND, 7.28 mil VND, and 3.04 mil VND per household for high-income, medium-income and low-income households, respectively. The interest rate is approximately 1% per month for formal credit and 5% per month for informal one; and the duration of the loan is usually one year. The main usage of loan is to buy fertilizers and to payback old debts. In general, the credit system at the local area improved and provide better service, but most of households still consider that the available funds is short for needs and lending procedures are complicated.



Picture 1. Rice field with small and scattered plots



Picture 2. Rice transplantation

4.2 Collectors

At Yen My town, collecting households mainly use trucks, tractors, and bicycles to support their rice collecting activities. They not only buy rice from the local area, but also cover the buying services in other provinces such as Nam Dinh, Thai Binh, Ninh Binh, Hue, and some provinces in the South of Vietnam.

The means used for transportation depend on the distance, capacity, and capital resources of each household. Table 12 shows the situation of activities of the five collecting households interviewed. In average, each household bought 770.5 tons and 906.5 tons of paddy and white rice annually, respectively. Most of the paddy and white rice are from their own provinces and from the provinces of the South. Table 15 shows that 26.89% and 37.54% of paddy is bought from Hung Yen province and from the provinces in the South respectively. About 31.58% and 33.03% of white rice are purchased from Hung Yen province and the provinces of the South respectively. The cost of collecting rice from its own province is less due to minimal transportation cost. The paddy and white rice from the provinces in the South are usually better in quality with copious types of varieties, and cheaper. Those are reasons why rice from the South is bought in greater quantity even though transportation fee is higher.

Since access to formal information about the rice market in Vietnam is still limited

Table 12. Rice collecting activity of household (unit: ton/household)

Province	Total volume of paddy	Ratio (%)	Total volume of white rice	Ratio (%)
Total	770.50	100.00	906.50	100.00
1. Local area	207.20	26.89	286.30	31.58
2. Nam Dinh	81.10	10.52	110.50	12.18
3. Thai Binh	93.60	12.14	98.70	10.88
4. Ninh Binh	50.70	6.58	61.20	6.57
5. Hue	48.80	6.33	50.60	5.58
6. The South	289.10	37.54	299.20	33.03

Source: survey 2002

due to many reasons, therefore such informal source like friends and partnerships in local area and provinces are good sources providing information on the supply and demand of rice consuming market. The price is set based on negotiation between the buyers and sellers. There are two main factors in setting the price that are the prevailing market price and the quality of rice.

Sometimes rice is sold immediately after collecting. However, sometimes rice has to be put into warehouse. The duration for white rice or paddy to be kept in the warehouse depends on the fluctuation of price market risk and capital sources of the collectors to cope with the risk. The storing method is that rice simply put into bag and stored in the warehouse. The warehouse storing capacity is 31.6 ton.

Paddy and white rice will be sold back to wholesalers, rice milling and processing households, or buying agencies of the government. In many cases, collecting households are also participated in rice milling and processing activities.

Of the 5 collecting households studied, all are involved in some sources of financial credit. They borrow money from the Agriculture and Rural Development Bank, Commercial Bank, and merchants. The average loan is 75 to 80 millions VND. Interest rate is normally at 1.2% per month for formal credit and much higher (about 5–7%) for informal one. The duration for loan is usually for one year. The main purpose of the loan is to upgrade the transportation equipments, to repair or build new warehouses, and to finance for the rice collecting process.

According to the local people, the interest rate is reasonable. However, they need more financial resources and long-term borrowing duration. Therefore, we can say the two main obstacles for those collectors at Yen My district are restriction of financial resources and lack of information.

4.3 Rice Milling and Processing

Of the total 35 rice milling and processing households, there are only five households, which also participate in the rice collecting services (abbreviated as collecting M.P. households). The rest are involved only in rice milling and processing services. In order to meet the standard of export, rice for export must always go through the polishing process.

Collecting M.P. households purchase white rice and paddy from various areas. Besides the local area (Hung Yen province), they also buy paddy and white rice from other provinces such as Nam Dinh, Thai Binh, the provinces in the south and other

Table 13. Paddy collecting activity of collecting M.P. household
Unit: ton/household

Province	Paddy volume	Ratio (%)
Total	644.2	100.00
1. Local area	196.87	30.56
2. Nam Dinh	82.09	12.74
3. Thai Binh	87.54	13.58
4. The South	231.92	36.01
5. Other provinces	45.78	7.11

Source: survey 2002

regions. Table 13 shows the volume of collected paddy in 2001. Two areas with highest purchased volume are provinces in the south and local area (Hung Yen province) with 231.92 ton (36.01%) and 196.87 ton (30.56%), respectively. The main transportation means are truck, tractor and bicycle.

The capacity of rice milling and processing as seen in the table 14 is quite difference among groups of households. Milling capacity in average per year of large scale, medium scale and small scale plant is 3666.67 ton, 1666.75 ton and 1139 ton, respectively. However, the efficiency rate of each type of plant also varied. At top efficiency rate bracket, the capacity is 38.5 tons/day for households with large-scale plants, and only 8.18 tons/day for households with small-scale plants. At the medium efficient rate bracket, the capacity is 11.67 tons/day and 4.09 tons/day for large-scale and small-scale, respectively. At the lowest efficient rate basket the capacity is only 4.17 ton/day and 0.5 ton/day for large scale and small scale. In general, they work all year round, but the busiest season is always just after the harvesting season. As also seen in the table, almost milling machines of 3 groups still have not exploited in full capacity. Several reasons explained for this problem are as follow: firstly, due to capital shortage; Because of lacking of capital, so households could not purchase large volume of paddy and rice. Secondly, lack of space for storing and keeping rice.

Table 14. Milling capacity of milling and processing household

Capacity	Unit: ton/day, day		
	Paddy volume		
	Large scale	Medium scale	Small scale
1. Highest	38.5	12.38	8.18
2. Medium	11.67	7.29	4.09
3. Lowest	4.17	1.89	0.5
Milling capacity per year	3666.67	1666.75	1139
90–100% capacity	155	103.85	110.29
70–89%	95	110.91	71
50–69%	115	99.55	83.33
30–49%	90	91.1	76
Less than 30%	–	44.59	–

Source: survey 2002

Table 15 shows the storage capacity of households. Most of households don't have enough space for storing rice. They usually have to use their living house as rice store house. Lack of good condition and measures for storing and maintaining, therefore rice can not be kept for long time, especially in the rainy and humidity season. Due to lacking of capital, and space, so the holding period also can not last longer to more than 1 month.

There is no difference in service charges for milling and polishing among groups of household. Table 16 shows the breakdowns of service charges for milling of one ton of paddy. According to table 16 the service charges are mainly involved with the labor and fuel/electricity costs. Labor cost accounts for over 47.3%, and fuel/electricity 24% of service charges.

For those households, which involved in paddy collecting activity (collecting M.P

Table 15. Storage capacity

Type of HH	Capacity (ton)	Holding period (day)
Collecting HH	31.6	1–7 (2.0)
Small scale milling HH	35.5	2–7 (2.3)
Medium scale milling HH	51.04	7–16 (7.5)
Large scale milling HH	80	5–30 (12.5)

Source: survey 2002

Table 16. The charge of milling service (unit: 1000VND/kg)

Item	Structure of total cost	Ratio (%)
Total cost	63.42	100.00
1. Labor cost	30	47.30
2. Electricity, petrol cost	15.82	24.94
3. Depreciation	3.6	5.68
4. Other costs	5	7.88

Source: survey 2002

households), they usually buy paddy from collectors or deal directly with rice growers. Price setting process is based on negotiation between buyer and seller. As normal, the price depends on the supply and demand of rice in the market and quality of rice. Four of 5 interviewed large-scale households, accounting for 80%, answer that they could get accurate information on rice price in the market.

Before milling, paddy is graded according to rice varieties and quality. The average capacity of their warehouse is 80 tons, and they always have paddy in reserve from one week to one month. According to the five households with paddy collecting activity (collecting M.P. household), 70% of total white rice volume is sold for wholesaler, 20% for retailers, and the rest of 10% for government agencies.

Total cost for one ton of white rice is 2899.78 thousand VND of which the cost for buying paddy occupies 93.69% as shown in table 17. After milling and polishing, the

Table 17. Milling cost of 1 ton of rice (unit: 1000VND/ton)

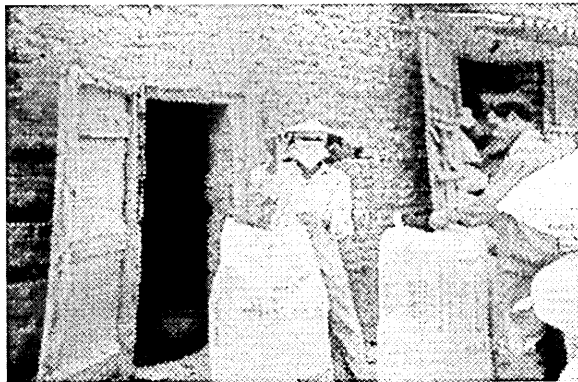
Item	Quantity	Ratio (%)
Total cost	2899.78	100
Paddy purchase	2714.28	93.69
Transportation cost	100	3.49
Loading/unloading cost	10	0.35
Electricity, oil and fuel	15.5	0.53
Labor	40	1.4
Depreciation	10	0.35
Sack cost	5	0.18
Other	5	0.18

Source: survey 2002

weight conversion ratio between paddy and white rice is about 70%. Other by-products such as husk and bran are returned to customers. According to assessment of local government leaders and heads of households, milling and polishing equipments are fairly new and modern.

According to observation and study, two main obstacles for rice milling and processing households are shortage of electricity and restriction of surface area used for production. Many households want to expand the surface area of production and build new warehouses, but there is no land available. Besides, each household is bound by certain amount of electricity for usage in production. Some households want to invest in more equipment, but they are faced with shortage of electricity. If they use more electricity for equipment, it will lead to the long-term disruption of electric power since the power line is old. Therefore, the capacity of power line is another major obstacle and should be addressed first in order of priority.

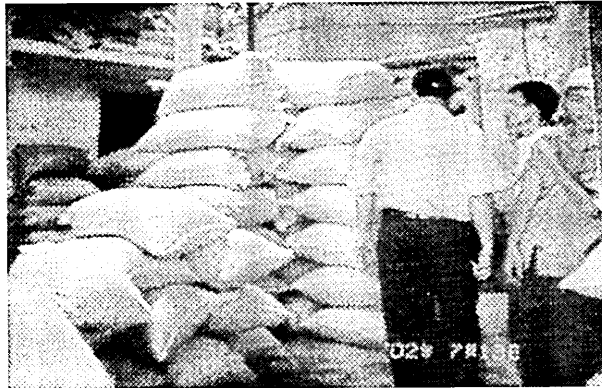
In addition, there are other issues should be pay attention such as dirt, dust coming from the rice milling and polishing process, noise, and environment pollution. They affect the life of many people.



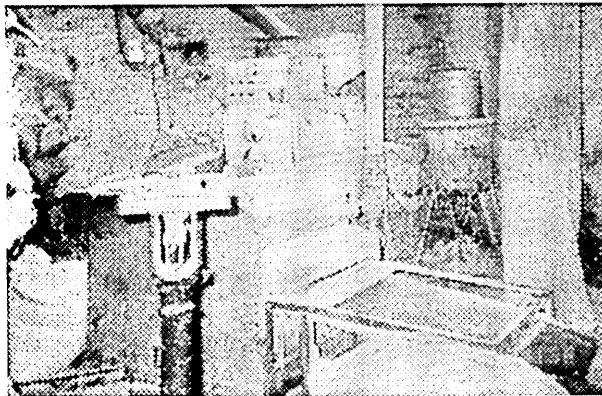
Picture 3. At the small rice mill



Picture 4. The poor condition of warehouse



Picture 5. rice is stored in sacks



Picture 6. Rice milling machine

5 Conclusion

Eventful trading and processing activities in Yen My reflected the gradual change in restructuring of agriculture of North Vietnam toward to diversified and sustainable agriculture in stead of pure one as previous period before renovation. For coming future, food crops and rice are still dominant crops in Red River Delta, however, the income from rice is very low and rice production in the North has less comparative advantage than that in the Mekong Delta. Main problems for rice growing farmer could be small and scattered land holding, high input price, and inefficiency of supporting organizations as well. Therefore, increase of production efficiency is one solution for rice production in the North, on the other hand, promotions of off-farm job and industry in rural are long-term strategies.

Rice collecting and processing households play very important roles in creating the

large marketing network, making bridge between the producers and consumers, narrowing the price gaps between the Mekong Delta and the North. They operate on quite large region, not only in the north, but other provinces of the Mekong Delta also. Thanks to those trading and processing activities, income of households have been improving and creating more employment in rural area. However, the common obstacles of collecting group are shortage of capital, limited access to credit and market information. For processing household main problems are: restriction of financial resources, too short duration term of loan, poor in information about the rice market, restriction of capacity of power line, or poor rural infrastructure and narrow surface area used for production.

The policy of diversified agriculture, combination of farming and non-farm activities should be promoted in order to improve farmers' income. The condition, procedure for loan should be improved so that more farmers could get access to formal credit. Activity of supporting organizations in rural area, especially extension organization, and new style cooperative should be improved to provide better service and meet the requirement of farmers on new agricultural knowledge and modern technology. Infrastructure in rural area should be upgraded to create the good conditions for processing industry development. Post harvest improvement is very necessary. The Government should promote an environment conducive to the private sector investment in post-harvest system. Storage facilities at the household level should need to be developed.

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