

Farming Systems and Farm Economy in On-Farm Trial Site in Omon District, Can Tho Province

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ABSTRACT

This study aimed to account for the whole complexity of the farming systems and farm economy in on-farm trial site in Omon district, Can Tho province. It was done through the intensive interview with 180 farmers of the O Mon district. As the results, agricultural production in O Mon is based on private smallholding with an average size of less than 1 ha. Rice monoculture covered more than 85% of cultivated area. Fruit tree was second crop occupied 14.7% cultivated area. Non-farm and off-farm activities were the most important income source accounting for 68% of the total income of households. The next important source of income was rice farming which contributed 28% to total income of household. Income from non-rice crop production and animal husbandry was inconsiderable. Income sources also differed widely among farmer classes. The major source of income inequality among households can be identified as the inequality in land ownership and the operation of other enterprises out of agricultural production. A conspicuous feature of the O Mon peasant economy is that the farmers' income was almost completely derived from production within the village. Employment opportunities for farmers outside the village were severely limited.

Continued efforts for the improvement of rice cropping will be most critical to the output increase. The direction of the technological improvement should be towards the increasing of the labor's share in the output. Expansion of livestock and poultry production should be encouraged because those enterprises are not based on land resources. Efforts should be made to encourage various production activities to satisfy the demand of local consumption. The expansion of non-rice production activities such as fruit trees, upland crops and fishery should be encouraged to increase the income and utilization of labour that remains idle during the off-season months of rice farming.

INTRODUCTION

O Mon is one district of Can Tho province where irrigated rice systems have been practised for a long time. In terms of agricultural production, this district can be representative for the irrigated rice areas of the Mekong Delta in both aspects of physical environment and productivity. Besides, O Mon is selected as one of research sites for conducting on-farm trials under second phase of the JIRCAS project titled "Development of New Technologies and Their Practice for Sustainable Farming Systems in the Mekong Delta". Understanding socio-economic conditions in research site, particularly on farmers' farming systems and economic condition, is prerequisite for researchers before conducting the on-farm trials. This study was conducted with the aims at helping

researchers (1) to understand present farming systems at the target site, (2) to identified problems and constrains on technical aspects of farmers, and (3) to develop sound technical solutions for improving farming systems in O Mon towards sustainable agricultural production.

DATA COLLECTION

An intensive survey of farm households was conducted in mid-2001. Socio-economic data covering the 1999-2000 crop year were collected by direct interviews with farmers. A sample of 180 households of three villages in different sub-agro ecosystems of the district was drawn by ranking method. Farm households in each village were divided into three groups including poor, average and rich farmers. Unlike urban workers for which the

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labour market is well established, the landless farmer here was considered as a critical element of the peasant community. As so, households of both farm operators and landless farm workers were incorporated in the survey. Collected data were handled and analyzed by SPSS, software specified for socio-economic research.

RESEARCH SITE PROFILE

O Mon is located in the West site of Bassac river (Song Hau), a branch of the Mekong river. The district is divided into three distinct agro-ecological sub-regions based on soil characteristics and surface water regime (Nguyen van Nhan 1994). Along the river, soils offer slightly acidic pH (pH: 5 to 5.5), and alluvial soils with a loamy to clay-loamy texture are common. Two distinct dry and wet seasons are involved. Wet season starts from May to November. Average rainfall varied 1,500 - 2,000 mm concentrated mainly from July to October. Being situated in low lands with dense distribution of small creeks and river systems, the area is rich in water resources. The field water level is influenced by a semi-diurnal tidal regime so that water shortage is not considered as a problem in dry season. However, flood should be considered as a major constraint with the water depth of 50 to 100 cm during four months in the wet season. This is a big problem for agricultural production, particularly for non-rice crops and fruit trees.

In rice production area of O Mon, three-rice cropping / year (triple rice) accounted for 50%. Rice production, the main income source of the farmer, contributed to 85% of the total gross value (CESVI-CLRRI, 1996). The average yields of dong xuan (Nov-Mar), he thu (May-Aug), and xuan he (Mar-Jun) were 5.8, 4.07 and 4.36 ton/ha, respectively. Fruit trees played an important role of the

cultivated area. The dominant fruit trees are mango, citrus, sapodilla, plum and longan. However, about 25% of the fruit gardens needed to be improved (Nguyen xuan Lai 1998).

At the time of survey, population of O Mon consisted of 301,000 persons, equally distributed over male and female (Year Book 1999). The population growth rate at O Mon obtained 2.0%, which was somewhat higher than the average rate for Vietnam (1.7%).

FARM HOUSEHOLD CHARACTERISTICS

The major characters of farm household in Omon were shown in table 1. The household heads got an average age of 51.3 years and an educational level was equivalent to class 5. Of which, about 17.8% of them was illiterate and 50% attained primary school level. Number of people obtained secondary and high school levels were 11.9 and 10.4, respectively. The education level varied between farm groups: the richer the farmer the higher the education level. The average number of family members per household was 5.44, of which 3.80 belonged to the economically active population (16 to 65 years old, the labour force potentially available). However, there were huge differences in family size and number of working members per household between farm groups: the richer the farmer, the bigger the household size and the higher the number of working members.

The farm sizes ranged from 0.13 to 3.80 ha with an average of 0.82 ha (table 2). About 84.2% of cultivated area was devoted to rice crops with a dominance of triple rice pattern. Fruit trees covered about 14.6% of the total cultivated area. The area under upland crops was neglected.

Table 1. Household characteristics of the sample households, O mon, Can Tho, 1999-2000.

Character	All sample	Farm group		
		Poor	Normal	Rich
No of sample	180	58	80	42
Age of household head (year)	51.30	49.20	51.50	53.90
Education attainment (year)	4.97	3.55	5.27	5.49
Of which: - Illiterate (%)	17.80	22.40	14.90	17.10
- Primary (%)	49.40	56.80	48.40	43.80
- Secondary (%)	11.9	17.40	25.80	22.00
- High school (%)	10.40	3.40	10.90	17.10
Household size (person)	5.44	4.90	5.70	5.80
Working member (person)	3.80	3.31	4.03	4.15

There was a huge variation in size distribution of farms in terms of the operational holdings. About 25.3% of the farmers owned less than 0.5 ha, 27.1% owned from 0.5 to 1.0 ha, 27.1% cultivated in area with farm-size of 1.0 and 2.0 ha and only 5.9% owned more than 2 ha. Table 2 also showed that the richer the farmer, the larger

the farm size. The concentration of land into rich households quickened over recent years. Large farmers seemed to expand their land whereas small farmers lost land. That accounts for the increase in the number of landless workers. At present, the number of landless workers was 14.7% on average.

Table 2. Land resources of households in Omon, Can Tho, 1999-2000

Source	All sample	Farm group		
		Poor	Normal	Rich
Total cultivated area (ha)	0.82	0.43	1.80	1.43
Rice cultivated area (ha)	0.69	0.33	0.69	1.21
– Double rice	0.16	0.08	0.14	0.34
– Triple rice	0.53	0.25	0.55	0.87
Fruit tree area (ha)	0.12	0.10	0.11	0.22
Variation in farm size (%)				
– Landless	14.70	29.10	6.60	10.300
– Less than 0.5 ha	25.30	36.40	30.30	0
– 0.5-1.0 ha	27.10	27.30	34.20	12.80
– 1.0-2.0 ha	27.10	5.50	26.30	59.0
– Greater than 2 ha	5.90	1.80	2.60	17.9

FARMING SYSTEMS

As mentioned above, agricultural production in OMon was typical rice monoculture. More than 84% of cultivated area of the district is under sole rice. Fruit trees were planted in nearly 15% of cultivated area. The area devoted to upland crop is inconsiderable. Although integrated farming systems such as rice-fish culture and fruit tree + fish have been practiced in OMon recently,

the area under these systems in the sample is neglect. The most popular cropping systems are shown in table 3. About 79.3% of the farmers only grew rice. Of which, about 75% farmers grew triple rice and 25% double rice. In the sample, about 20% of the farmers gained fruit orchards. Of which, 17.2% farmers cultivated both rice and fruit trees and only 3.4% farmers grows fruit trees.

Table 3. Cropping systems in different farmer groups (%), Omon, Can Tho, 1999-2000

Character	All sample average	Farmer groups		
		Poor	Normal	Rich
Double rice	20.0	20.9	19.4	20.0
Triple rice	59.3	65.1	59.7	51.4
Double rice + fruit tree	4.1	0.0	3.0	11.4
Triple rice + fruit tree	13.1	9.3	13.4	17.1
Fruit tree	3.4	4.7	4.5	0.0

RICE PRODUCTION CHARACTERISTICS

Rice is grown in three seasons: the dry (dong xuan), wet (he thu) and spring-summer season (xuan he) depending on cropping systems: double or triple crops. As shown in table 4, most popular rice varieties grown in O

Mon were IR 50404, OM 1490, OMCS 99 and OMCS 2000 which are short duration, high yielding and good quality, except IR 50404. Same varieties were grown in different seasons.

Table 4. Popular rice varieties grown in O Mon, Can Tho, 1999-2000 (% farmers applied).

Variety	Crop season		
	Dong xuan	Xuan he	He thu
IR 50404	26.6	35.5	36.2
OM 1490	30.9	25.4	26.7
OMCS 2000	18.7	10.1	10.5
OMCS 99	9.4	9.4	9.5
Other	14.4	19.6	17.1

Farmers used to apply high and equal seed rate in all seasons. On average, farmers applied from 230-240 kg/ha for dong xuan, xuan he and he thu. Seed rate applying variation among farmer groups is not much. Fertilizer doses applied for rice crops varied from 80-90 kg N, 43-45 kg P₂O₅ and 17-20 kg K₂O/ha. However, there was huge variation in

fertilizer doses among farmer groups, the higher rate applied at the richer farmers' field. The poors used to apply lower rate as compared to recommendation. The similar trend was also observed with pesticide application. The average rice yields of dong xuan, xuan he and he thu were 5.8, 3.9 and 3.3 tones/ha, respectively.

Table 5. Material inputs for different rice crops, O Mon, Can Tho, 1999-2000.

Item	Crop seasons		
	Dry	Summer-Spring	Wet
1. Seed rate (kg/ha)	238	237	240
- Poor farmer	242	235	240
- Normal farmer	235	238	242
- Rich farmer	238	236	237
2. Nitrogen application (kg/ha)	81.8	89.1	80.0
- Poor farmer	49.3	55.3	54.7
- Normal farmer	78.5	86.9	80.2
- Rich farmer	124.9	132.0	113.7
3. Phosphorus application (kg/ha)	43.3	45.3	44.1
- Poor farmer	29.2	32.7	33.1
- Normal farmer	39.4	42.3	41.3
- Rich farmer	66.8	65.3	64.8
4. Potassium application (kg/ha)	18.5	20.0	17.5
- Poor farmer	8.8	9.4	9.3
- Normal farmer	16.7	18.0	15.2
- Rich farmer	32.8	35.8	33.6
5. Pesticide application (kg ai/ha)	1.2	1.1	1.1
- Poor farmer	0.7	0.5	0.5
- Normal farmer	1.3	1.2	1.3
- Rich farmer	1.5	1.4	1.4
6. Yield (tone/ha)	5.8	3.9	3.3
- Poor farmer	5.7	3.9	3.5
- Normal farmer	5.9	4.0	3.3
- Rich farmer	5.9	3.9	2.9

Economic efficiency of rice production was present in table 6. The input variation of different seasons was not large. For each season, labors required 63-69 days / ha, material input: 1.8-2.0 million VND / ha, other inputs: 0.4-0.7 million / ha including land preparation and post harvesting. Total

production costs varied from 3.3 to 3.5 million VND depending on season. However, large difference in net return was recognized. The highest net return was obtained in dong xuan season, followed by xuan he. The lowest value of net return was recognized in he thu season.

Table 6. Economic efficiency of rice production by crop season, O Mon, Can Tho, 1999-2000.

Entry	Crop seasons		
	Dong xuan	Xuan he	He thu
Total labour input (days/ha)	63	68	69
Family labors (days/ha)	47	50	51
Hired labors (days/ha)	16	18	18
Material input (1,000 VND/ha)	1,919	1,859	1,810
Other inputs (1,000 VND/ha)	673	413	491
Total cash inputs	2,837	2,557	2,569
Total inputs (1,000 VND/ha)	3,541	3,309	3,331
Total output (1,000 VND/ha)	6,718	5,652	4,629
Return above cash cost (1,000 VND/ha)	3,881	3,095	2,060
Net return (1,000 VND/ha)	3,117	2,343	1,298

Generally, a farmer could produce 8.3 tones of rice per year. However, the total production per household varied by farm group: the richer farmers the higher the production obtained. That could be explained by rich farmers used to own larger farm size. The rice produced in farm was disposed of through sale, home consumption or seed for coming season. However, disposition of rice depends on the rice price. Many farmers, particularly poor farmers, sold all their rice just after harvesting

due to cash requirement for repay loan, whereas others kept their product at home to wait for price raising. In general, about 70 to 80% of the rice was sold for cash.

Rice production contributed an average of 10.4 million VND to total income of household with net income of 4.9 million VND. The variation in income of household also followed trend that the richer farmers the higher income gained.

Table 7. Income of households from rice production, O Mon, Can Tho, 1999-2000.

Item	All sample average	Farmer group		
		Poor	Normal	Rich
Total production (kg/household)	8,378	4,642	8,580	13,862
Total output (1,000 VND/household)	10,417	5,705	10,785	17,115
Total cash cost (1,000 VND/household)	5,507	2,774	5,542	9,708
Net income (1,000 VND/household)	4,910	2,931	5,243	7,407

Non-rice crop production

In O Mon, fruit tree production is an important enterprise. The most predominant fruit trees planted in O Mon are mango,

longan, sapodilla, plum and orange. Among fruit tree gardens, there were 23.3 % area with less benefit orchards which needs to be improved.

Table 8. Fruit tree production characteristics, O Mon, Can Tho, 1999-2000.

Item	All sample average	Farmer group		
		Poor	Normal	Rich
Number of farmers applied (%)	26.5	22.2	23.5	38.0
Kinds of tree (%):				
– Mango	18.9	25.0	16.7	15.8
– Longan	18.9	18.8	27.8	10.5
– Plum	11.3	18.8	5.6	10.5
– Sapodilla	9.4	0	16.7	10.5
– Orange	7.5	0	0	21.1
Benefit garden (%)	66.7	50.0	57.1	90.0
Total labours (days/household)	45.5	26	38	87
Total output (1,000 VND/household)	460.1	90	353	1,229
Total cash cost (1,000 VND/household)	295.1	143	304	515
Net income (1,000 VND/household)	168	-53	53	714

Cost and income from fruit tree production are shown in table 8. Per household, farmers devoted to fruit tree production is 45.5 labor days per household, of which, about 75% was contributed by family labour. There are large variations in cash cost, total output and net income per household. Those variations depend on the farm size and the type of garden because the area under fruit trees and the age of the trees are not similar among farmer groups. Particularly, income from fruit tree production was low in 2000 because of the negative impact of yearly flood.

Upland crops have been also cultivated in O Mon either in rotation with rice or monoculture. The most popular upland crops are soybean, green bean, hybrid corn, sugarcane and vegetable crops. In the past, upland crops were the main income source of many farmers such as soybean in Phuoc Thoi. However, the upland crop areas decreased sharply because of low prices. In this study, the area under upland crop was inconsiderable.

ANIMAL HUSBANDRY

The major species of livestock raised in O Mon are pigs, ducks and chickens. On average, about 19.49% of the farmers raised livestock. Of which, 47.8% household raised pork and 25% raised with 2.8 heads/household (table 9). The number of households raising pigs and the number of pigs per household depended on specific farm group. About 69% of the rich farmers raised pigs with 4.7 heads per household. These figures were less than 49% and 50%, for the poor and normal farmers, respectively. Hired labour was not employed for the animal husbandry. The total family labour devoted to this activity was low from 33 to 51 workdays per household. Farmers used to feed their pigs by home made materials such as rice bran, milled rice, vegetables, and kitchen residues. Few farmers used concentrated food for livestock. Besides pigs, poultry was raised by many farmers (27% household). However, most farmers raised poultry for home consumption purpose. Livestock raising contributed for a considerable portion of farmer income.

Table 9. Cost and income of households from animal husbandry, O Mon, Can Tho, 1999-2000.

Item	All sample average	Farmer group		
		Poor	Normal	Rich
Number of farmers applied (%)	19.4	22.6	18.4	17.1
Kinds of animal (%):				
– Pork	47.9	48.3	55.3	69.2
– Saw	25.0	12.3	8.6	25.0
– Poultry	27.1	39.3	36.2	5.8
Total labours (days/household)	41	43	33	51
Total income (1,000 VND/household)	949	778	1,102	946
Total cash cost (1,000 VND/household)	884	781	907	1,020
Net income (1,000 VND/household)	65	-4	195	-74

OFF-FARM AND NON-FARM ACTIVITIES

The major off-farm activities were recognized as hired labour that attracted 24% farmers. Off-farm activities contributed considerably to the income of the farmers, particularly of the poor and normal farmers (table 10). Non-farm activities were important income sources of farmers. The popular non-

farm activities operated in O Mon included small business, handicraft, service, and receiving salary. Off-farm and non-farm activities attracted 227 workdays per household and contributed a large amount to the total income of farmers, particularly for rich farmers.

Table 10. Household income from off-farm and non-farm activities, O Mon, Can Tho, 1999-2000.

Item	All sample average	Farmer group		
		Poor	Normal	Rich
Number of farmers applied (%)	75.0			
Major activities (%):				
– Working as hired labors	24.0	38.8	23.7	
– Service	16.4	4.5	17.1	34.2
– Worker	14.8	22.4	11.8	7.9
– Salary	13.7	7.5	17.1	15.8
– Handicraft	10.9	6.0	17.1	7.9
– Small business	10.4	9.0	6.6	21.1
Total labors (days/household)	227	200	210	307
Total income (1,000 VND/household)	25,308	8,100	7,180	85,307
Total cash cost (1,000 VND/household)	7,184	285	487	30,207
Net income (1,000 VND/household)	18,123	7,815	6,693	55,100

HOUSEHOLD INCOME

It is hazardous to estimate the household income from an interview survey. However, admitting the data limitations, rough estimates were made of the household's income (table 11). The incomes of the *O Mon* households varied from about 14.7 to 101.3 million VND with an average of 37.1 million VND. Average income per capita was 6.8 million VND.

There were large income differences among the farmer classes in *O Mon*. The rich farmers' income was more than five times higher than the normal farmers' one, and

almost seven times higher than the poors. Based on income per capita, the rich farmer's income was about 5 to 6 times higher than the poors and the normals' ones.

Off-farm and non-farm activities were the most important income source accounting for 68% of the total income of households. The next important source of income was the rice farming (28%). Non-rice crop production and animal husbandry contributed an inconsiderable portion to total household income.

Table 11. Total income per household, O Mon, Can Tho, 1999-2000 (1,000 VND/household).

Source	All sample average	Farmer group		
		Poor	Normal	Rich
Rice farming	10,417	5,705	8,580	13,862
Non-rice crop production	460	90	353	1,227
Animal husbandry	949	778	1,102	946
Off- and non-farm activities	25,308	8,100	7,180	85,307
Total income	37,134	14,673	17,215	101,342
Income per capita per year	6,826	2,994	3,020	17,473

SOME POLICY IMPLICATIONS

A conspicuous feature of the *O Mon* peasant economy is that the farmers' income was almost completely derived from production within the village. Employment opportunities for farmers outside the village were severely limited, especially for people without education and skills. In such a situation, increases in farmer income are only possible through increases in the production output of the village. Since no more land is available in the village, the increase in output

can only be achieved by increasing the productivity of land in rice production.

It appears that land concentration created an inequality within the village. The major source of income inequality among households can be identified as the inequality in land ownership. The income differentials were primarily due to the differences in the size of operational holdings. Population growth pressure will continue to be considered under limited land resource condition. The landless people will increase even more sharply. Competition for land and

employment will be harder. The system that has been effective in sharing income gains within the community might not be preserved unless great efforts are made to overcome the population pressure by increasing the employment and income. How can such goals be achieved? Continued efforts for the improvement of rice cropping will be most critical to the output increase. The direction of the technological improvement should be towards the increasing of the labour's share in the output. Expansion of livestock and poultry production should be encouraged because

those enterprises are not based on land resources.

The expansion of non-rice production activities such as fruit trees, upland crops and fishery should be encouraged to increase the income and utilization of labour that remains idle during the off-season time of rice farming.

Indeed, a critical question for the development of the household economy is how to organize the household's labour for effective capital formation through adequate technical and financial assistance.

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SUMMARY IN VIETNAMESE

Điều tra hệ thống canh tác và kinh tế nông nghiệp của huyện Ô Môn

Nghiên cứu này nhằm đánh giá một cách tổng thể hệ thống canh tác và kinh tế hộ nông dân tại điểm nghiên cứu ở huyện Ô Môn, Cần Thơ. 180 hộ nông dân đã được chọn và phỏng vấn trực tiếp. Kết quả nghiên cứu cho thấy sản xuất nông nghiệp của Huyện Ô Môn chủ yếu được thực hiện tại nông hộ có qui mô diện tích dưới 1 ha. Độc canh lúa chiếm diện tích trên 85%. Diện tích cây ăn trái chiếm 14,7%. Hoạt động phi nông nghiệp đóng góp 68% tổng thu nhập của nông hộ. Thu nhập quan trọng thứ hai là trồng lúa chiếm 28% thu nhập của nông hộ. Thu nhập cây màu và chăn nuôi chiếm tỷ lệ không đáng kể. Các nguồn thu nhập thay đổi rất lớn giữa các nhóm nông dân khác nhau. Sự khác nhau về thu nhập giữa các hộ chủ yếu là do sự khác nhau về quy mô nông trại và sự tham gia các ngành nghề khác. Một đặc điểm nổi bật của Ô Môn là kinh tế người nông dân tùy thuộc hoàn toàn vào những hoạt động trong làng xã của mình đang sinh sống. Cơ hội tìm việc làm ở địa phương khác vô cùng hạn chế. Cố gắng cải thiện về sản xuất lúa sẽ là điều quan trọng nhất làm tăng nguồn thu nhập cho nông dân. Hướng cải tiến về mặt kỹ thuật cần chú ý việc tăng sự đóng góp của lao động gia đình trong tổng thu nhập. Phát triển chăn nuôi cần được khuyến khích bởi vì nó sẽ không đòi hỏi nhiều về tài nguyên đất. Khuyến khích phát triển sản xuất cây trồng ngoài lúa như: cây ăn quả, cây màu và nuôi trồng thủy sản để đa dạng hoá các nguồn thu nhập và tạo việc làm cho nông dân trong những tháng không trồng lúa.
